International Petroleum Encyclopedia

1985

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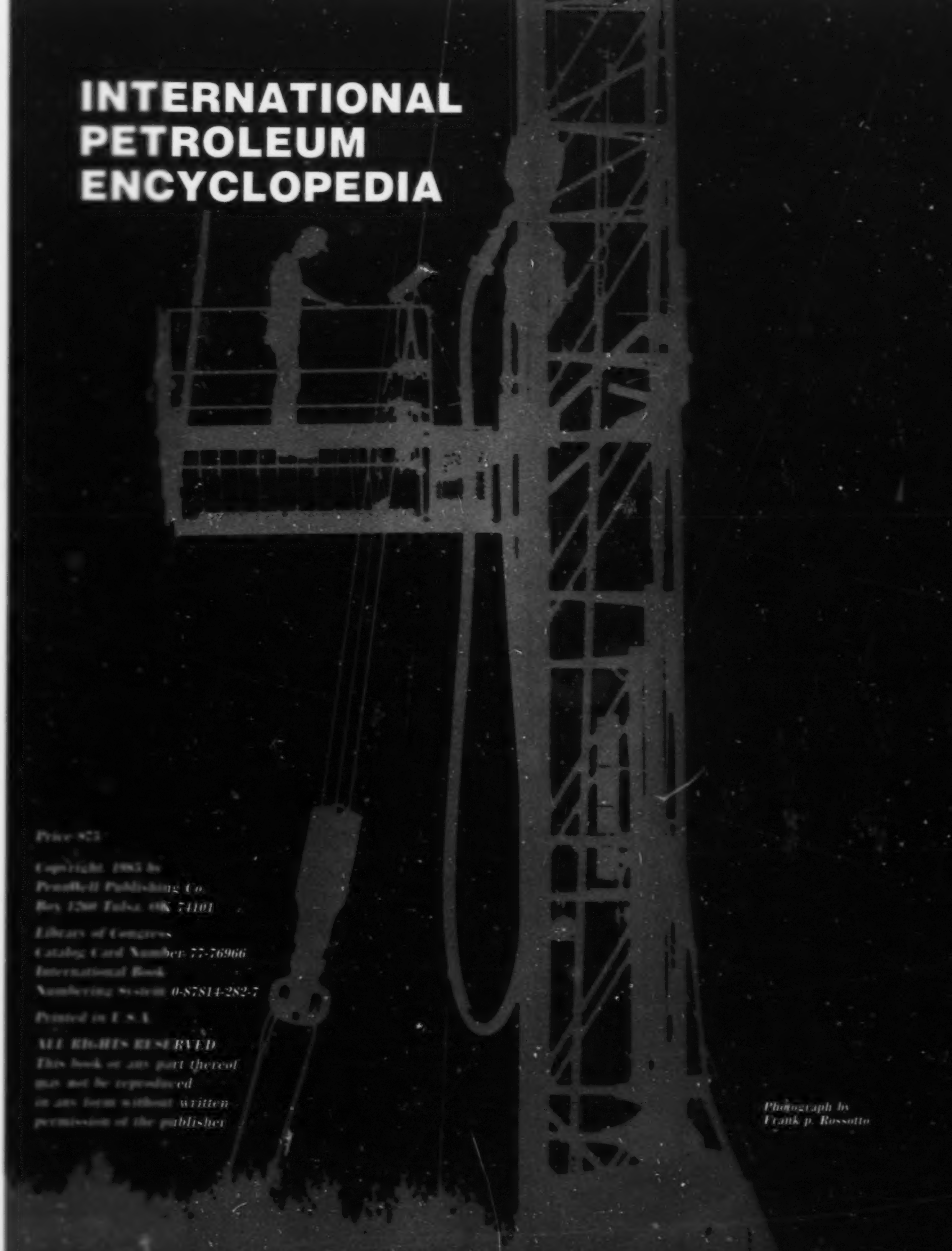

Price $25

Copyright 1985 by
PennWell Publishing Co.
Box 1260 Tulsa, OK 74101

Library of Congress
Catalog Card Number 77-76966
International Book
Numbering System 0-87814-282-7

Printed in U.S.A.

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INTERNATIONAL PETROLEUM ENCYCLOPEDIA

Offshore China
第二届廣州近

China opens its doors 7

NORTH AMERICA

United States 34
Canada 80

ASIA PACIFIC

Australia 88
India 92
Bangladesh 93
Indonesia 94
Japan 97
Malaysia 102
New Zealand 104
Pakistan 104
Papua New Guinea 105
Philippines 106
South Korea 106
Thailand 106
Other Asia Pacific 109

MIDDLE EAST

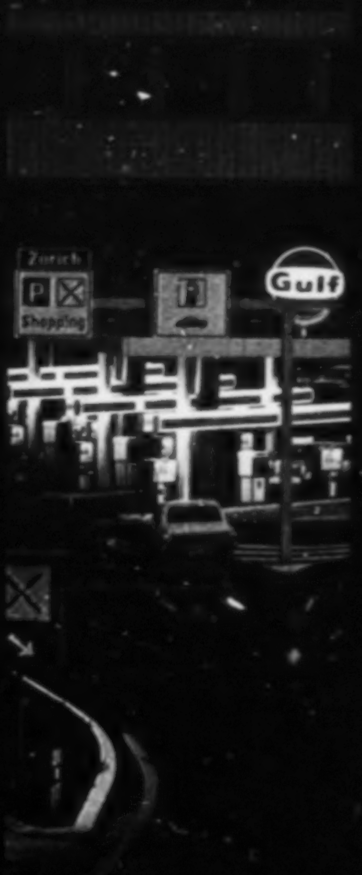
Iraq 110
Iran 113
Qatar 114
Oman 114
Israel 116
Jordan 118
Kuwait 118
Lebanon 120
Syria 120
Turkey 120
South Yemen 122
Saudi Arabia 122
United Arab Emirates 126

AFRICA

Algeria 128
Benin 132
Angola 132
Egypt 132
Nigeria 134
Ivory Coast 135
Libya 135
Gabon 136
Ghana 137
Sudan 137
Kenya 137
Tunisia 138
Other Africa 143

LATIN AMERICA

Argentina 144
Brazil 146
Colombia 149
Ecuador 151
Cuba 154
Mexico 156
Peru 158
Trinidad & Tobago 160
Venezuela 162
Other Latin America 163



EUROPE

Finland 166
Belgium 166
Denmark 166
Austria 167
France 167
Ireland 170
Greece 173
Italy 173
Netherlands 178
Norway 179
Portugal 182
Spain 182
Sweden 184
United Kingdom 188
Switzerland 192
West Germany 192
North Sea 198

EASTERN EUROPE 218

U.S.S.R. 222

Seismic operation 240
Canada outlook 247
Production outlook 257
Worldwide oil and gas 258
Production by fields 266
Primary energy production 282
Active rigs 283
Worldwide well completions 285
Gas production table 286
Alaska outlook 288
Offshore outlook 298
Mergers 310
Oil production statistics 316
Oil consumption statistics 320
Refining statistics 321
Heavy Oil report 326
Metric conversion, general 344
Refining survey 345
Iran Iraq war 358
Comparison, energy prices 364
Industry finances 365
Pipelines 369
Tankers 378
International directory 384
Gas processing 392
Ad index 393

Active rigs ... 281

Advertisers' index ... 391

Agencies, petroleum ... 384

Alabama offshore leases ... 299

Alaska outlook ... 288
  Endicott field
  Prudhoe Bay ... 303

Athabasca tar sands ... 131

Bohai Gulf, China ... 25

Biggest mergers ... 315

Butane production ... 392

Buyouts, mergers ... 310

Canada outlook ... 247

Capital, exploration, operating
  for major companies ... 366

Cat cracking ... 346

Cat reforming ... 346

China
  Bohai Gulf ... 25
  Coal reserves ... 30
  Eastern China basins ... 16
  Heavy crude-oil areas ... 14
  Outlook
  South China Sea
    exploration area ... 25
  South China Sea
    basin origin ... 13

Coal production ... 282

Coal reserves, China ... 30

Company mergers ... 310

Comparison of
  energy prices ... 364

Completions ... 285

Construction costs,
  pipelines ... 174, 175, 176

Consumption statistics ... 320

Conversions,
  U.S.-metric, general ... 144

Crude-oil pipelines,
  investments ... 172

Crude runs by major
  companies ... 365

Diesel fuel prices ... 364

Directory, worldwide ... 384

Drilling
  Bohai Gulf ... 25
  South China Sea ... 25
  Well completions ... 285

Eastern China basins ... 16

Energy prices, comparison ... 364

Energy, primary production ... 282

Endicott field, Prudhoe Bay ... 303

Ethane production ... 392

Exploration
  Bohai Gulf, China ... 25
  International crew
    count ... 281

  Seismic activity ... 241
  South China Sea ... 25
  Wyoming proposals ... 240

Finances
  24-company group ... 366, 367
  Other company
    performances ... 368

Gas
  Production by countries ... 286
  Production by major
    companies ... 367

Gas processing ... 392

Gas production ... 286

Gulf of Mexico rig use ... 301

Heavy crude oil areas, China ... 14

Heavy fuel prices ... 364

Heavy oil ... 326
  Athabasca tar sands ... 131
  Outlook ... 326
  Reserves ... 334
  [illegible] ... 330

Income, major companies ... 367

Industry finances ... 366

International
  Directory ... 384
  Active rig count ... 281

Interstate U.S. pipeline
  mileage ... 172

Investments, liquid-
  product pipelines ... 171

Investment split, pipelines ... 172

Iran-Iraq war ... 358

Isobutane production ... 392

Leases, off Alabama ... 299

Leases, off Norway ... 300

Light fuel prices ... 364

Major companies
  Capital, exploration
    costs ... 367
  Gas production ... 367
  Net income ... 367
  Refined product sales ... 367
  Crude runs ... 367
  Net income/gross
    operating revenue ... 367
  Total assets ... 367
  Total revenues ... 367
  Working capital ... 367

Mergers ... 310
  Industry's biggest
    mergers ... 315
  Mergers stock market
    performance ... 311

Metric conversions, general ... 144

Motor gasoline prices ... 364

Natural gas prices ... 364

Natural gas production
  By major companies ... 366
  Worldwide ... 282

Non-committed pipeline
  construction ... 170, 169, 171

Norwegian offshore leases ... 300

Nuclear energy production ... 282

Offshore
  Leases off Alabama ... 299
  Leases off Norway ... 300
  Outlook ... 298
  Pipeline construction
    costs ... 174, 175
  Remotely operated
    vehicles ... 304
  Rig utilization,
    Gulf of Mexico ... 301
  Rig utilization,
    worldwide ... 301
  Worldwide production,
    oil ... 307
  Worldwide well count ... 308

Oil
  Historical statistics ... 316
  Offshore oil produced,
    total ... 307
  Production by country ... 257
  Well completions ... 285

Offshore pipeline
  construction costs ... 174, 175

OPEC production,
  tankers for ... 379

Operating refineries ... 346

Petroleum agencies,
  worldwide ... 384

Pipeline
  Construction costs ... 170, 175
  Investments ... 172, 171
  Non-committed pipeline
    construction ... 169, 170, 171
  Offshore construction
    costs ... 174, 175
  Onshore construction
    costs ... 174
  Outlook ... 169
  U.S. interstate mileage ... 172
  U.S. interstate system ... 172

Prices ... 364

Primary energy production ... 282

Production
  By country ... 260
  Crude oil, NGL by
    major companies ... 366
  Fields by countries ... 260
  Gas ... 286
  Oil production ... 307
  Outlook ... 257
  Primary energy ... 282
  Statistics ... 316
  Well completions ... 285
  Worldwide production ... 307

Products
  Consumption statistics ... 320
  Pipelines
    investment ... 172

Propane production ... 392

Proved reserves ... 258

Prudhoe Bay, Endicott field ... 303

Refining
  Historical statistics ... 324
  Operating refineries ... 346
  Throughput ... 357
  Survey ... 345
  Worldwide
    refining capacity ... 346

Remotely operated vehicles ... 304

Reserves
  Heavy oil ... 334
  Worldwide ... 258

Revenue, major companies ... 367

Rig count ... 283

Rig utilization,
  Gulf of Mexico ... 301

Rig utilization, offshore
  by class ... 301

Seismic
  Crew count ... 241
  Technology ... 240

Time zone map ... 2-3

South China Sea exploration ... 25

South China Sea,
  basin origin ... 13

Special reports
  Alaska ... 288
  Canada ... 247
  Heavy oil ... 326
  Iran-Iraq war ... 358
  Mergers ... 310

Statistics
  Production ... 316
  Consumption ... 320
  Refining ... 324

Stock market ... 311

Survey, refining ... 345

Takeovers ... 314

Tankers
  for OPEC production ... 379
  Size age distribution ... 383
  Tonnage, for scrap ... 379, 380

Throughput, refinery ... 357

Thermal operations,
  refineries ... 258

War, Iran-Iraq ... 358

Well completions ... 285

Well count, offshore ... 308

Worldwide
  Consumption ... 320
  Gas processing ... 392
  Gas production ... 286
  Offshore oil
    production ... 307
  Offshore rig utilization ... 301
  Oil and gas
    at a glance ... 258
  Operating refineries ... 346
  Production ... 260
  Refineries ... 346, 357
  Reserves ... 285
  Rig use,
    Gulf of Mexico ... 301
  Rig use, worldwide ... 301
  Well completions ... 285

Table 1

China's heavy crude oil areas

Area	Field	Project	Depth (Ft)	Gravity	Viscosity (CP/°F.)	Recovery method
Liaoning Province, Liaohe oil area	Gousheng	Pilot started in 1982	4,922-5,578	14°	300/133	Steam soak
Liaoning Province, Liaohe oil area	Shuguang 1	Pilot planned	3,281	10-13°	3,000/104	Steam soak
Liaoning Province, Liaohe oil area	Jin 7	Pilot planned	2,953-3,281	14°	8,000/108	Steam soak
Shandong Province, Shengli oil area	Shanjiasi	Pilot planned	3,281-3,937	10-11°	5,000/133	Steam soak
Xinjiang Kelamayi oil area	Fengcheng	Pilot planned	984-1,312	10-11°	100,000-500,000/68	Steam soak

Source: United Nations from Petroleum Exploration and Development Scientific Research Institute data

other heavy industries in the area.

Raymond's partners are Wah-Chang International Corp. (Singapore) Pte. Ltd., a diversified engineering firm with headquarters in Singapore, Guangzhou Shipbuilding Corp., a subsidiary of China State Shipbuilding Corp., with ship and drilling rig fabrication facilities in Guangzhou; and Shenzhen Nautical Corp., a subsidiary of Shjenzhen Municipal Authority, which has ship repair, shipping, and marine construction operations in Shenzhen.

Another contract among two Chinese oil companies and a U.S. firm set up a joint venture to provide laboratory, engineering, consulting, and field services for offshore and onshore oil development.

The contract, for a term of 10 years, was signed by the Scientific Research Institute of Petroleum Exploration & Development, Nanhai Eastern Petroleum Corp., and Core Laboratories International Ltd. of the U.S. It established China-Corelab Ltd., based in Beijing.

Downstream. China in 1984 continued to press its campaign seeking foreign assistance for development of its downstream operations.

Fluor China Inc. and China Petrochemical International Co. (Sinopec) signed an agreement in November for a 50-50, broad scope venture calling for Fluor to provide construction of petrochemical plants, design and upgrading of refineries, and project management services for a wide variety of upstream and downstream oil and gas work.

Sinopec, which has about $10 billion/year in revenues and employs 500,000 workers, agreed to work out capitalization.

In addition, Sun Refining & Marketing Co. and an affiliate of CPC in August set up a Chinese joint venture, China Sun Oil Co., to produce 50,000 tons/year of lubricating oil.

Registered capital of the company was $6.5 million, of which $4-4.5 million was budgeted to build the lube oil refinery.

Hybrids. China and Bechtel Group Inc., San Francisco, in April formed a 50-50 joint venture to provide a variety of engineering services.

The 15 year agreement between China National Coal Development Corp. and International Bechtel Inc. set up China American International Engineering Inc. (CAIE), which planned to operate in China and abroad.

CAIE initally planned to provide pipeline, strip coal mine, coal preparation plant, coal gasification, and civil engineering services. The venture also may handle petroleum, underground mining, metallugical, chemical, power, and communications engineering projects.

The joint venture will offer planning, feasibility study, detailed design, geological surveys and reserves assessment, project management, personnel training, and technology transfer services.

In addition, M.W. Kellogg Co., Houston, and Cntic signed protocols aimed at creating two joint ventures in China.

One protocol was designed to lead to development of a large expatriate residential community in China, the other to result in formation of a consulting organization to help other foreign firms set up joint ventures in China.

Offshore exploration

With onshore oil production stabilized at about 2 million b/d, the Chinese industry figured its big hope for a sizable boost in production rested on the frontier continental shelf.

But as 1985 got under way, an intensive exploration program by foreign firms had turned up only two offshore discoveries—both in the South China Sea—on newly acquired acreage. Industry's search on competitive bid acreage in the South Yellow Sea had proved fruitless.

ARCO-Santa Fe gas strike. A combine of ARCO China Inc. 70% and Santa Fe Minerals (Asia) Inc. 30% in August 1984 confirmed its 13-1-1 Yacheng gas discovery of September 1983 at a site 65 miles south of Hainan Island.

The confirmation, Yacheng 13-1-2, 1½ miles east of the discovery, flowed 64 MMcfd of gas on three tests through ¾ in. choke with about 2,600 psi surface flowing pressure from a Lower Tertiary sandstone. Flow rates were restricted by capacity of test equipment.

The Zapata Arctic semisubmersible drilled the well in 300 ft of water.

ARCO officials said the second well confirmed a potential productive capacity of several trillion cubic feet a day from the field. The company conducted preliminary talks with Chinese officials on possible markets for the gas, including an ammonia/urea fertilizer complex on Hainan Island.

The Yacheng 13-1-1 strike flowed a combined 42 MMcfd of gas and a small volume of condensate through ⅝ in. choke with more than 3,000 psi surface flowing pressure on tests of two undisclosed intervals in a Lower Tertiary sandstone slightly below 12,000 ft. The flow was restricted by the size of equipment in the well, ARCO said.

The ill-fated Glomar Java Sea drillship spudded the well in 293 ft of water Apr. 5, 1983, on a 3,490 sq mile block in the Yingge Hai basin south of Hainan Island. The rig later sank with a loss of 81 lives during a tropical storm in the area.

The Yacheng strike proved the existence of good reservoir rock in the Yingge Hai basin, where industry sources believe China has the best chance of discovering giant oil and gas

Table 2
China's coal reserves

Region	Coal and lignite (Billion tons)
Northeast	20.0
North	411.3
East	41.8
South Central	23.7
Northwest	77.1
Southwest	68.6
Total	642.5

Source: World Bank from Ministry of Coal Industry data

year of coal at first, with production eventually rising to 45 million tons/year. In its final stages, the project will be the largest coal mine in the world, Oxy said.

China is to invest about $240 million and foreign partners $400 million to develop the An Tai Bao surface mine in the Pingshuo mining area of northern China's Shanxi Province, the country's leading coal producer.

Oxy's original partner in the project was Peter Kiewit Sons Inc., Omaha, Neb., a construction and mining company. Kiewit withdrew later in the year, and China Trust & Consultancy Co. agreed in principle to replace the firm as a 50-50 investment partner.

Xinhua said Oxy's agreement with China National Coal Development Corp. will run for 30 years, with each side to receive 50% of the profits until payout. Then the Chinese will receive 60% and the U.S. firms 40%.

The cooperation area of the An Tai Bao mine, which will cover 6½ sq miles, holds estimated reserves of 452.53 million tons of coal.

Chinese officials agreed to link the wages of miners with production and to assume responsibility for marketing all the coal.

China was building a city for 17,000 persons at the mine site.

CHINA Bohai Drilling Corp.'s Bohai 10 jack up drilled a dry wildcat in 1984 in Contract Area 23/06 of South Yellow Sea for group led by BP Development Ltd.

Backing out oil. Substituting coal for oil as boiler fuel is an important measure in China's national economic development program, Xinhua reported in March 1984.

The plan, approved by the National People's Congress, featured two aspects—switching boilers from oil to coal fuel and building new coal burning equipment.

China cut oil consumption by 80.3 million bbl during the preceding 5 years by changing 2,181 oil burning boilers to coal burning units, the State Planning Commission reported.

China planned to replace or refit 530 oil burning boilers during 1984. Upon completion, about 10.22 million bbl/year of oil will be saved.

The commission said the oil thus saved will be used to expand production of petrochemicals and increase fuel supply for internal combustion engines, which are increasing every year.

The Chinese government attached great importance to this project, the commission said. Since 1979, 1.7 billion yuan had been earmarked to refit oil burning boilers.

Premier Zhao said China should continue to change oil burning boilers to coal burning units.

"The emphasis in energy should be on coal and hydroelectricity," he said.

Oil shale. World Bank said China's oil shale reserves were reported unofficially to be about 400 billion tons.

Reserves may be much larger because the geological environment is favorable for oil shale formation in many of the country's sedimentary basins.

Deposits of 100 billion tons or more, containing 5-10 billion tons of oil, were reported in Heilongjiang and Hebei provinces.

Oil content of most shales is fairly low—less than 10%—but a few deposits hold 10-20 wt % of oil.

Before 1958, shale oil accounted for almost half of Chinese oil production. But the proportion declined rapidly as conventional crude oil production increased after discovery of Daqing oil field.

Shale oil production was under way in at least two fields—Fushun in Liaoning Province and Maoming in Guangdong Province.

At the Fushun plant raw shale came from an open pit coal mine, where shale overlies the coal. The rate of shale extraction is therefore geared to coal production.

The Fushun shale oil plant, with a

Table 1

Major changes proposed in oil and gas taxation

	Fiscal year federal tax receipts 1986	 1987	 1988	 1989	 1990
	Million $				
TAX CHANGE					
Repeal percentage depletion					
Individual	530	1.226	1.301	1.375	1.430
Corporate	834	1.209	1.332	1.453	1.548
Index basis of certain depletable assets					
Individual	–	-8	-32	-61	-88
Corporate	–	-58	-178	-310	-427
Repeal expensing of intangible drilling costs					
Individual	651	1.605	1.264	1.043	1.014
Corporate	4.760	6.979	5.439	4.720	4.620
Repeal expensing of tertiary injectant expenses					
Individual	–	–	–	–	–
Corporate	21	57	93	132	174
Repeal special treatment of royalty income					
Individual	36	99	106	112	119
Corporate	5	9	9	10	10
Accelerate phaseout of "windfall profits" tax					
Individual	–	–	16	71	148
Corporate	–	–	167	620	1.118
Excise	–	–	-476	-2.106	-3.482
Total					
Individual	**1,217**	**2,922**	**2,655**	**2,540**	**2,623**
Corporate	**5,620**	**8,196**	**6,862**	**6,625**	**7,043**
Excise	**–**	**–**	**-476**	**-2,106**	**-3,482**

Source: Treasury Department

merely an accelerated alternative to cost depletion as a means of recovering investments in natural resources. Rather, it is a subsidy to the exploitation of natural resources that is administered through the tax system. This subsidy increases with the prices of natural resources.

"Percentage depletion encourages overproduction of scarce domestic resources, adds complexity to the tax system, unfairly benefits owners of those resources, and erodes the perception of fairness of the tax system."

Windfall profits tax. Treasury pointed out that the windfall profits tax was enacted in 1980, when crude oil prices were rising rapidly, and enactment was associated with decontrol of crude oil prices.

"Since that time," Treasury said, "crude oil prices have moderated and, in fact, have significantly declined from record high levels. Consequently, the perceived windfall for producers has generally vanished. Furthermore, the tax offset some of the additional stimulus to domestic production provided by oil decontrol."

A July 1984 report by Treasury said flat oil prices had kept windfall profits tax collection to a level far below that anticipated when the law was enacted.

Treasury's tally showed the tax had raised $33.3 billion [illegible] fiscal 1980-83, although Congress had estimated collections of $56.1 billion during the period (Tables 2 and 3).

Treasury estimated that net windfall profits tax collections under the schedule then in force will total about $57.4 billion through calendar 1986, less than one half of the $126.5 billion Congress had anticipated.

If that trend continued, Treasury said, the tax likely would not meet the $227.3 billion goal set by Congress.

A General Accounting Office (GAO) report said about $13 billion of the $69.1 billion tax shortfall stemmed from changes Congress made through provisions in the Omnibus Reconciliation Act of 1980 and the Economic Recovery Tax Act of 1981.

Industry's tax bite. Large U.S. oil companies pay a substantially higher tax rate than large nonoil companies, said a study released in May 1984 by Petroleum Industry Research Foundation Inc. (Pirinc), New York.

U.S. tax liability of the 17 oil firms studied increased greatly during 1974-81 (Fig. 1).

But foreign tax payments fell due to nationalization of foreign subsidiaries.

Pirinc said, "We can conclude that large petroleum companies shoulder a relatively large total tax burden, including levies which are not imposed on most other industries. Payments under the windfall profits tax in the last several years have added to the industry's burden.

"Large petroleum companies' effective income tax rate is also higher than the average rate of other industries, despite the reductive effect of the windfall profits tax on oil industry income taxes in the years in which it is has been in effect."

The study was conducted in light of "the burgeoning projections of the federal budget deficit and various legislative proposals to reduce it through selective additional taxation."

Among the study's findings:

- Oil firms paid an average of 26.4% of pretax income in taxes during 1980-82, compared with 16% by 213 large, nonoil firms.
- Total U.S. tax liabilities, excluding excise taxes on oil products, for the oil firms was $37.4 billion in 1981, compared with $4.9 billion in 1974.
- The federal income tax has been replaced by the windfall profits tax as the largest single levy on oil companies. Part of that change, however, comes from a reduction in income taxes because windfall profits tax payments can be expensed.
- The oil firms' tax liability was 13.4¢/dollar of receipts in 1981, compared with 5.4¢/dollar of receipts in 1974.
- The oil companies saw a decline in their combined U.S. and foreign tax rates during 1974-80 due entirely to the drop in foreign taxes as foreign units were nationalized in several nations. The rate in 1980 was 12.6¢/dollar of receipts, compared with 17¢/dollar of receipts in 1974.

Weak profits. The prospect of higher taxes was especially worrisome to the petroleum industry because of its generally weak earnings performance.

Net income of 24 U.S. companies in the Oil & Gas Journal (OGJ) group of companies climbed only 1.4% to $22.4 billion during 1983. The slight improvement left profits 23.3% below the 1980 peak of $29.2 billion (Fig. 2).

The companies, including all major firms and several smaller ones, operate in the U.S. and abroad.

A sharp drop in third quarter 1984 profits wiped out a large portion of the earnings gain chalked up during the first half of the year.

Combined third period earnings of the companies plummeted 30.3% from the same period of 1983, trimming the earnings gain for the first 9 months to 3.8%.

Group profits were up 31.8% from 1983 during the first quarter of 1984 and up 10.7% in the second quarter.

Earnings for the group totaled $16.076 billion for the first 9 months of 1984, up from $15.489 billion during the same period of 1983. Total revenues were $339.251 billion, up a little more than 2% from the first 9 months of 1983.

Table 2

Estimated windfall profits tax collections

	Fiscal year 1980	Fiscal year 1981	Fiscal year 1982	Fiscal year 1983	Cumulative 1980-83
	Million $				
Gross receipts	6,934	23,425	18,458	12,203	61,020
Less federal receipts					
Minerals Management Service	−101	−562	−644	−582	−1,889
National Petroleum Reserves	−392	−543	−448	−320	−1,703
Gross private sector receipts	6,441	22,320	17,366	11,301	57,428
Less overpayments in prior years					
Form 1040	0	−237	−445	−262	−944
Form 1120	0	−524	−290	−638	−1,452
Forms 843, 1040X, 1120X	0	−173	−51	−68	−292
Gross receipts excluding refunds	6,441	21,386	16,580	10,333	54,740
Less estimated reduction in individual income tax payments	−379	−1,354	−1,201	−715	−3,649
Less estimated reduction in corporate income tax payments	−1,741	−6,215	−5,926	−3,913	−17,794
Net budget effect	4,321	13,817	9,453	5,706	33,297

Source: Treasury Department

Table 3

Original estimate of tax revenue

	Calendar year	Fiscal year
	(Million $)	
1980	6,306	3,172
1981	14,719	13,436
1982	18,875	19,543
1983	20,147	19,958
1984	21,312	21,144
1985	22,267	22,227
1986	22,907	22,776
1987	23,778	23,601
1988	24,588	24,423
1989	26,771	25,593
1990	27,017	26,772
Total*	**227,723**	**222,646**

* May not add due to rounding

Source: 1981 joint committee on taxation

the industry's new business conditions—surplus worldwide productive and processing capacities, lower crude oil prices, a collapse in prices for deep gas, and a depressed U.S. natural gas market.

But they were encouraged by forecasts for increased oil and gas demand during 1984.

So, once again, many large firms saw increased investment opportunities, although they no longer were based on expectations of steadily rising prices.

But smaller independents were still adjusting to reductions in crude prices and natural gas demand. Spending by this segment of the industry, which relies heavily on outside capital, continued in a deep recession in 1984, more than offsetting increases planned by larger firms. Many small independents remained immobilized by balance sheet troubles, tight bank credit, and reluctance of outside investors whose spending spree helped fuel the drilling surge of 1980-81.

Spending for exploration and production again was to account for more than 70% of total outlays at $45 billion, down 3.7% from 1983. Drilling claimed about $29.6 billion of the 1984 total.

Capital and exploration expenditures reported by 11 companies in the OGJ group tended to keep pace with earnings during 1984. Spending by this group totaled $25.973 billion for the first 9 months of 1984, up 4.1% from the previous year. This represented 200.5% of profits for this group for the 3 quarters.

Reserves stable. The U.S. industry was operating from an essentially stable base of oil and gas reserves during 1984.

The Energy Information Administration (EIA) reported in September 1984 that crude oil reserves declined less than 0.5% in 1983. A good increase in natural gas liquids reserves more than made up for the decline in oil reserves. Natural gas reserves were slightly lower.

EIA said U.S. reserves as of Dec. 31, 1983, were 27.7 billion bbl of oil, 7.9 billion bbl of NGL, and 200.25 trillion cu ft of dry gas.

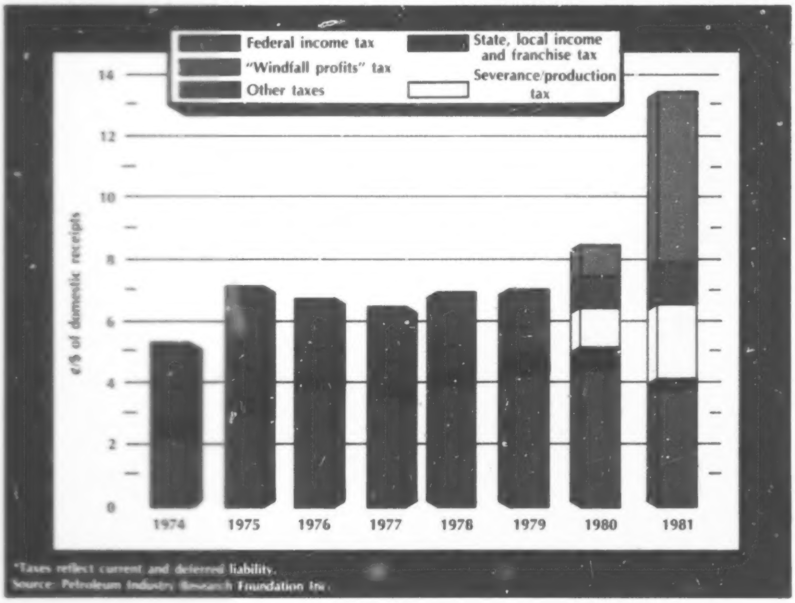
Oil reserves fell 0.4% from year earlier figures. The 123 million bbl decline was the smallest drop by volume since 1980.

NGL reserves were 9.4% higher. And the 680 million bbl advance was the largest since this category moved into the plus column in 1979.

Combined crude oil and NGL reserves were up 1.6%.

Dry natural gas reserves slipped 0.6%. The 1.265 trillion cu ft slump was nearly six times the volume decline dur-

U.S. tax liability of large oil firms* 1



*Taxes reflect current and deferred liability.

Source: Petroleum Industry Research Foundation Inc.

• Exxon Co. U.S.A. began efforts to sell CO_2 from a large Wyoming field for EOR projects in fields in four northern Rocky Mountain basins and possibly Canada. CO_2 source was the LaBarge platform of Southwest Wyoming, the largest known structure in the Lower 48 in terms of CO_2 in place.

• Amerada Hess Corp. was in early stages of a pipeline project to transport CO_2 for enhanced oil recovery in the Williston basin of North Dakota and Montana. Anticipated CO_2 source was the Great Plains coal gasification plant near Beulah, N.D.

• Backers of a proposed CO_2 coal slurry pipeline from Wyoming to California were seeking equity financing from users and other sources. The complex project, costing $1.16 billion in 1984 dollars, also would involve a CO_2 pipeline across Wyoming. Project manager was Western Resource Transport, a subsidiary of Aquatrain Inc., Tulsa.

• A significant supply of CO_2 was soon to be available in southern Mississippi. A unit of Shell let contract for construction of a CO_2 pipeline to supply EOR projects in West Mallalieu field, Lincoln County, Miss., and Little Creek fields, Lincoln and Pike counties, Miss.

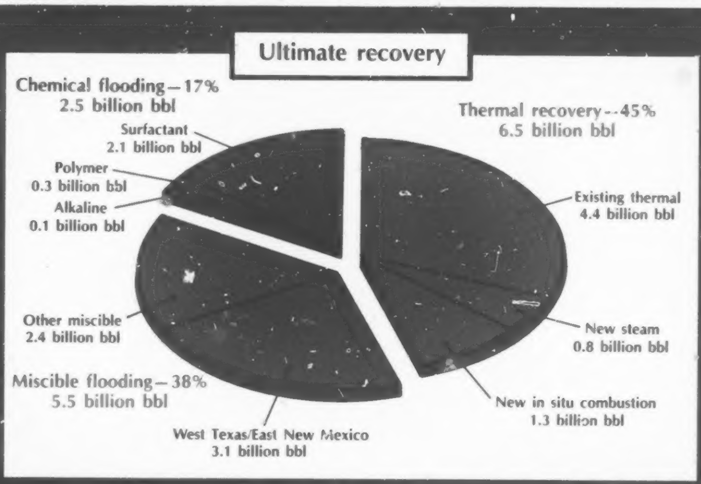
• A 135 mile pipeline was scheduled to transport CO_2 south from the Denver City, Tex., area to West Texas fields. Northern Natural Resources Co., a division of InterNorth Inc., ordered pipe and began purchasing right-of-way for the line to traverse Gaines, Andrews, Ector, and Crane counties.

Bravo expected to reach fill capacity of 1.1 billion cu ft of CO_2 in mid-December 1984. Source is Bravo Dome CO_2 Gas Unit, operated by Amoco.

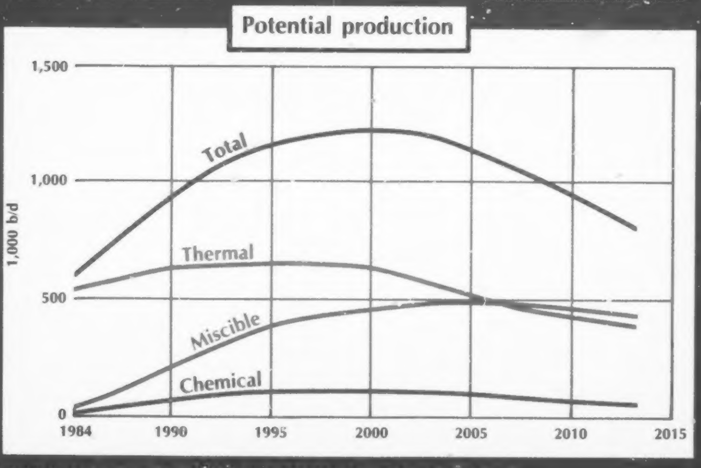
Bravo is a joint venture, common carrier pipeline owned by Sun Gas Transmission Co. Inc., Markland Pipe-

Outlook for enhanced oil recovery* **4**

Ultimate recovery



Potential production



*Implented technology, assuming nominal oil price of $30/bbl, 10% minimum rate of return.
Source: National Petroleum Council

1
A
B
C
D
Chukchi
Sea
Kotzebue
Sound
Bering Strait
Seward
Peninsula
Nome
Norton Sound
St. Lawrence I.
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Nunivak I.
Kuskokwim
Bay
Bering
Sea
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100
200 Mi.
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100
200
300 Km.
1

CANADA

CAPITAL: **Ottawa**
MONETARY UNIT:
Dollar
REFINING CAPACITY:
1,868,534 b/cd
PRODUCTION:
1.43 million b/d
RESERVES:
7.075 billion bbl

THE CANADIAN PETROLEUM industry entered 1985 expecting a new government in Ottawa to follow through on its campaign promises to sharply revamp the national energy program (NEP).

The expectation followed a Sept. 4, 1984, national election in which the Progressive-Conservative party, known as the Tories, won a huge majority to defeat the Liberal party, led by John Turner, which had governed Canada for most of the preceding 21 years. The election gave Canada a free enterprise oriented federal government, a sharp contrast to the Liberals' policies.

The petroleum industry, which offically remained neutral during the election campaign, was optimistic that the Conservatives would keep their campaign pledges for major reforms in the NEP, introduced by the Liberal government in September 1980.

Most of the industry strongly opposed the NEP, charging that it reduced cash flow and discriminated against multinational firms in federally controlled frontier areas.

Specifically, the NEP imposed a new tax on oil and gas production, gave a 25% unearned back-in right to state owned Petro-Canada on frontier lands and discoveries, and introduced a frontier exploration grant system that favored companies with a high level of Canadian ownership.

The Canadian Petroleum Association (CPA) said junking certain provisions in the Liberals' energy policy would allow the industry to step up spending and create many jobs for Canadians.

Producers, meantime, were moving late in the year to boost oil and gas exports to the U.S., a key market in the Canadian profits picture. Reduced export prices governed by negotiations between buyer and seller—not by government regulation—were allowing increased gas exports.

Producers, with an eye to the U.S. market, also were pressing development of heavy oil in costly projects.

The promises. The Conservatives, who had based their energy platform on consultations with the petroleum industry, promised to make major changes in the NEP and offer new incentives to the industry.

Table 1

Industry revenues, expenses*

	1982	1983	Change	Increase (Decrease)
	——Billion $——			Percent
Total revenues	**53.9**	**56.5**	**2.6**	**5**
Less operating costs	22.6	23.7	1.1	5
Interest costs	2.7	2.4	(0.3)	(8)
Royalties and nonincome taxes	13.3	12.5	(0.8)	(6)
Other costs	6.4	7.2	0.8	9
Income taxes				
Federal	1.5	2.0	0.5	31
Provincial	0.1	0.3	0.2	181
Internal cash flow	**7.3**	**8.5**	**1.2**	**16**
Less writeoffs	4.3	5.6	1.3	30
Deferred taxes	1.3	1.4	0.1	8
Net income	**1.7**	**1.5**	**(0.2)**	**(11)**

*Columns may not add to totals due to rounding.
Source: Petroleum Monitoring Agency

Table 2

Breakout of Canadian completions

	Number 1983	Number 1982	Percent change	Meters drilled 1983	Meters drilled 1982	Percent change
All wells						
Alberta	4,619	5,225	− 11.6	5,843,692	5,972,924	− 2.2
British Columbia	76	109	− 30.3	129,535	207,712	− 37.6
Saskatchewan	1,840	811	+126.9	1,683,524	693,538	+142.7
Manitoba	253	195	+ 29.7	234,292	184,292	+ 27.1
NW Territories	67	40	+ 67.5	71,709	63,760	+ 12.5
Offshore E. Coast	22	7	+214.3	99,681	34,099	+192.3
E. Canada (other)	218	174	+ 25.3	103,162	78,927	+ 30.7
Total	**7,095**	**6,561**	**+ 8.1**	**8,165,595**	**7,235,252**	**+ 12.9**
Wildcats						
Alberta	1,370	1,768	− 22.5	2,178,433	2,601,614	− 16.3
British Columbia	29	62	− 53.2	56,617	128,206	− 55.8
Saskatchewan	504	368	+ 37.0	484,102	316,095	+ 53.1
Manitoba	59	78	− 24.4	57,447	75,544	− 24.0
NW Territories	11	11	—	28,280	37,089	− 23.8
Offshore E. Coast	18	7	+157.1	82,220	34,099	+141.1
E. Canada (other)	50	47	+ 6.4	33,616	29,168	+ 15.2
Total	**2,041**	**2,341**	**− 12.8**	**2,920,715**	**3,221,815**	**− 9.3**

Source: Canadian Petroleum Association

Brian Mulroney, a Montreal lawyer who became the Tory prime minister, said the tax system for the energy industry was to be changed to a levy on profits rather than production. There also was to be reduced front end loading of taxes on large projects in favor of a tax system geared to long term payouts.

And the federal program of frontier grants on the basis of Canadian ownership levels was to be replaced by "more efficient incentives" such as tax credits.

Mulroney said the stated goals of the NEP—to increase Canadian ownership of the industry and encourage frontier exploration—were commendable, but the methods used and results obtained by the Liberal administration were not.

Among other pledges, Mulroney said his government would:

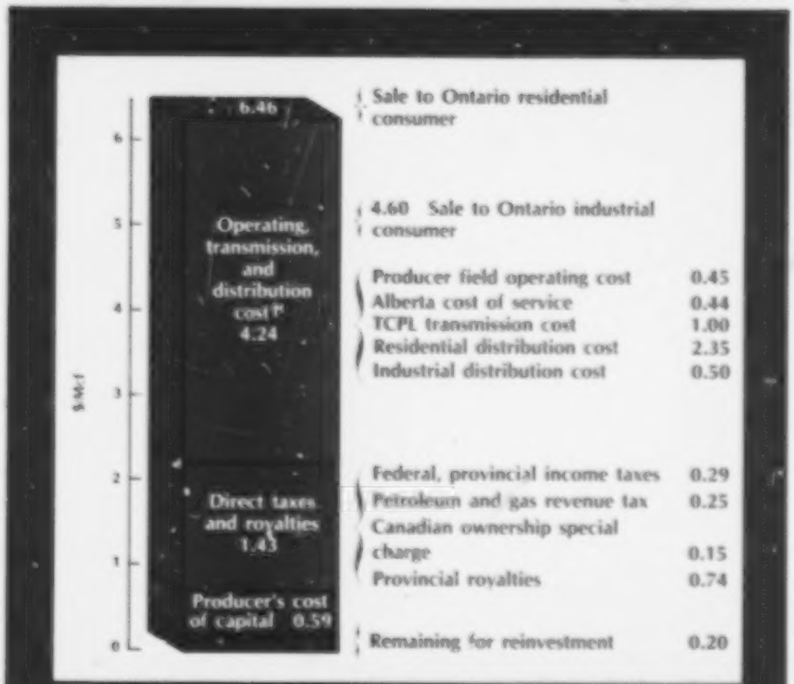
- Adopt "market sensitive" prices for natural gas exports to encourage long term shipments while insuring that the domestic price was less than the export price.
- Set aside Petro-Canada's retroactive back-in. The new government planned to introduce a "Canadian share" designed to encourage Canadian private and public ownership of oil and gas production. It planned to retain the requirement for 50% Canadian ownership of development projects on federal land.
- Change the mandate of the Foreign Investment Review Agency (FIRA), the federal agency which screens foreign investment in Canadian companies, to encourage an inflow of capital investment.

The action. About 2 months after the national election, the Canadian government had taken a major step toward oil price deregulation and was negotiating other changes in energy policy.

Industry spokesmen welcomed the

Where Canadian gas revenue goes*

6



*Estimated Feb. 1, 1984, revenue distribution from domestic natural gas sales, Canadian dollars. †Includes indirect taxes.
Source: Independent Petroleum Association of Canada

different estimating procedures.

ERCB said Alberta's conventional oil reserves increased for the first time since 1979 because of a high level of drilling. The board said the increase was due to discoveries, extensions, and enhanced recovery programs.

Oil reserves increased by 60 million bbl to 4.14 billion bbl at yearend 1983 after production of 352 million bbl during the year, ERCB figures showed.

Alberta gas reserves additions failed to keep up with production for the first time since 1975 as industry switched to oil exploration. Gas reserves declined by 900 billion cu ft to 67.4 trillion cu ft.

A report by CPA showed an increase of 8.1% in well completions during 1983 (Table 2).

CPA's tally showed that completions rose to 7,095 from 6,561 in 1982 with a surge in Saskatchewan and steady activity in Manitoba. Drilling in Alberta and British Columbia continued to decline.

CPA also reported a gain in oil drilling due to higher prices allowed under government controls and a decline in gas drilling because of a continued slump in markets (Fig. 3).

The number of oil completions increased 65.5% to 4,189 in 1983, while gas well completions declined 45.1% to 1,438.

Oil supply/demand. Canada will depend increasingly on oil sands and frontier oil, but supplies from those sources are uncertain because of economic factors, the National Energy Board (NEB) reported in September 1984.

NEB said Canada will have to rely on oil sands and frontier production for 68% of its oil supply by 2005 (Fig. 4).

Oil production averaged 1.4 million b/d during 1983, up 11.5% from the previous year.

NEB said the rate of production for conventional oil in western Canada was twice the rate of development. A proportion of heavy oil likely will be upgraded to augment supplies of light oil, but some form of incentive will be needed to make the upgrading process profitable.

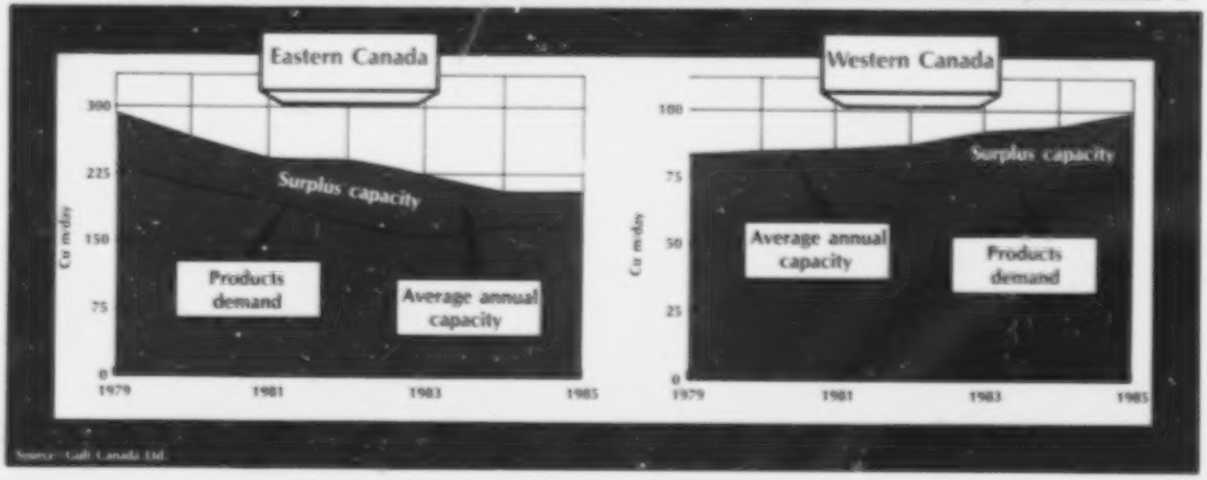
In its analysis of trends based on 65 submissions by industry, governments, and consumer groups, NEB said oil prices will begin rising faster than inflation about 1986 as depleting conventional oil is replaced with more costly supplies.

The board said Canadian energy use will grow 1.6%/year during 1983-2005, about one third of the 5%/year rate of increase in the 1960s and 1970s.

Oil demand dropped to 1.4 million b/d from a peak of 1.9 million b/d in 1979 and will decline to 1.3 million b/d by 1990. Oil's share of the energy market

Where Canada's surplus refining capacity lies

7



Source: Gulf Canada Ltd.

Breakout of Brazilian oil production by state

	July 1983	July 1984	Jan-July 1983	Jan-July 1984
		Bbl		
ONSHORE				
Ceara	46,167	45,286	254,926	312,226
Rio Grande do Norte	224,313	525,104	1,123,604	2,623,966
Alagoas	170,196	238,868	1,103,539	1,416,985
Sergipe	1,206,585	1,275,804	7,999,632	8,712,643
Bahia	2,249,729	2,351,630	15,385,618	15,669,012
Espirito Santo	564,227	564,994	3,704,309	3,916,173
Parana*	—	20,826	—	122,230
Maranhao	—	786	—	4,793
Subtotal	**4,461,217**	**5,023,298**	**29,571,628**	**32,778,028**
OFFSHORE				
Ceara	358,330	751,757	2,450,757	4,877,991
Rio Grande do Norte	538,847	460,539	3,819,632	2,956,646
Para	—	24,719	—	271,845
Sergipe	407,233	450,035	2,672,253	3,058,227
Bahia	223,917	183,278	1,676,232	1,432,860
Espirito Santo	46,167	146,458	352,386	811,674
Rio de Janeiro	4,113,089	8,463,304	27,781,153	51,193,746
Subtotal	**5,687,583**	**10,480,090**	**38,752,413**	**64,602,989**
Total	**10,148,800**	**15,503,388**	**68,324,041**	**97,381,017**

* Shale oil.

Source: Petroleo Brasileiro SA

basin, where installation of a seven platform permanent production system will be completed in 1985.

Petrobras planned before yearend 1984 to place on production its Brazilian record water depth well, 3-RJS-294 in the Campos basin. The well, which flowed 4,200 b/d of 29° gravity oil, lies in 1,345 ft of water. Site is a little less than 1 mile southeast 1-RJS-284, discovery for Pirauna field.

In addition, Petrobras aims to boost production from other onshore and offshore areas in Sergipe, Alagoas, Rio Grande do Norte, Ceara, and Bahia states.

Natural gas. Petrobras also has high hopes for Espirito Santo and the area off Bahia. It decided to renew drilling in the Santos basin in Sao Paulo state following a gas/condensate discovery there by Pecten do Brasil.

Brazil aims to step up gas development and consumption. Much of Brazil's gas is flared, but that is scheduled to change. Plans are on the drawing board to develop gas and put it to use, mainly in the industrial sector.

The Pecten gas strike's nearness to Sao Paulo, Brazil's biggest consuming center, makes it significant. If the discovery proves to be commercial, it will be a relatively easy and low cost project to lay an offshore gas pipeline. Santos gas would be a welcome alternative to present plans to move gas to Sao Paulo from far away Jurau in the Amazon.

Pecten's strike also renewed interest of foreign oil companies in risk contracts in Brazil.

More than $1.5 billion has been spent since 1976 by risk contractors to drill more than 100 wells. The only potentially commercial strike until now had also been by Pecten, in association with Chevron Corp. and Union Oil Co. of California, off Bahia state.

Marathon Petroleum Norte Brasil Ltda. added eight risk contracts for oil exploration in the mouth of the Amazon River.

The company had drilled two wildcats and spudded a third in August 1984. The first well had numerous shows of hydrocarbons but couldn't be tested.

Among other companies, Texaco Exploration Brasil Co. holds 14 onshore risk contracts in the Marajo basin at the mouth of the Amazon River.

Gene Bates, the company's senior vice-president, says Petrobras gave Texaco improved contract terms in awarding a 42 million acre block mostly onshore, the largest area awarded by the country at one time.

Petrobras is looking at long range plans to significantly increase national consumption, which also can reduce oil imports.

Petrobras hopes within 2 years to be able to use Campos basin gas that's now being flared.

The big question is how to tap Jurua gas field in the Amazon, far from key southern consumption centers.

Petrobras is studying the possibility of laying a pipeline across the heart of Brazil from the Amazon to Sao Paulo, an undertaking which is many years and many millions of dollars away.

Shortly after the Santos basin strike be Pecten, top Shell officials told the government that their company wanted to participate in natural gas distribution.

Shell's request for a role in the country's gas development program has not netted much encouragement. Cesar Cals, minister of Mines and Energy, says there is no need for foreign investment in the area. But there are differences of opinion concerning this question among top ranking members of the government, and no decision has been reached.

Petrobras made a promising gas strike off Ceara state.

The 1-CES-49 wildcat flowed 6.354 MMcfd of gas from pay at 3,281 ft. The well, in 111 ft of water, is 31 miles east of Fortaleza, the state capital.

The strike is promising because it taps shallow pay in shallow water, not too far from shore.

It also lies between two segments of gas pipeline under construction or planned onshore.

Petrobras disclosed it has another gas discovery in the Jurau River basin, which is undergoing tests.

Onshore. Although Petrobras success in recent years has come by way of offshore oil production, the company has not abandoned onshore drilling.

The company's aim is to at least maintain the current level of onshore production while increasing offshore production.

Secondary recovery programs are under way in Buracica field in Alagoas state, three fields in Sergipe state, and 16 fields in Bahia state, formerly the country's largest producing state.

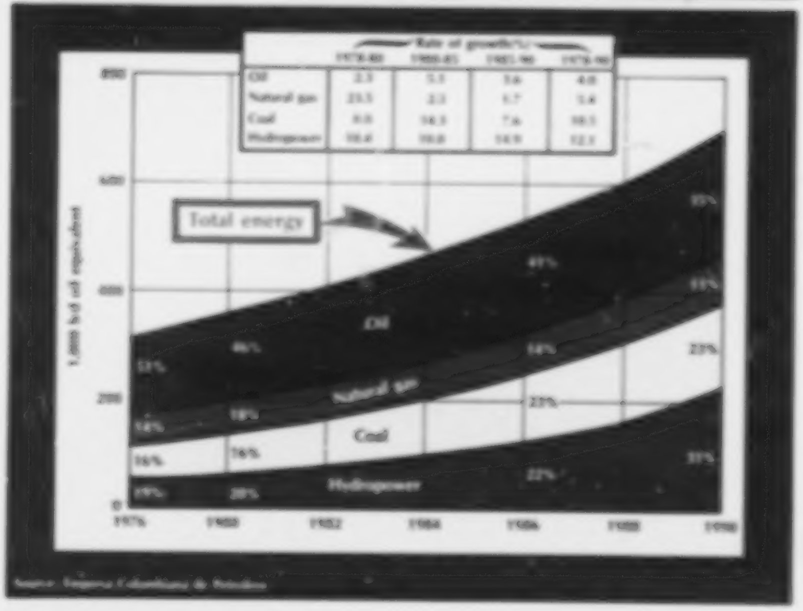
According to Petrobras figures, the nation's current reserves, assuming production remains at present 500,000 b/d level, guarantee production for only the next 11 years.

When the Figueiredo government assumed office in 1979 and production stood at 165,000 b/d, the country had enough reserves to guarantee production, assuming no new oil strikes, for 20 years.

Hopes are for strikes in deeper waters in the Campos basin and in shallow water off Ceara and Rio Grande Do Norte states. Onshore, Petrobras is confident with respect to a region be-

CANO LIMON DISCOVERY WELL in Northeast Colombia, tested in July 1983 for a combined flow of 10,723 b/d of oil from two zones in the Eocene Mirador, will be tapped by a pipeline.

How Colombia's energy demand will climb



Source: Empresa Colombiana de Petroleos

439,914 acre Rio Tame association contract.

- Subsidiaries of British Petroleum Co. plc and Exxon Corp. acquired options to earn interests in the 435,945 Capanaparo Sur block held by a unit of Jackson Exploration Inc., Dallas.
- A BP subsidiary agreed to acquire an interest in the 437,192 acre Rio Lipa and 436,221 acre Capanaparo association contracts from a unit of Jackson.

Jackson Exploration Colombia Inc.'s holdings lie southeast of the Cano Limon complex.

Oxy deal. Oxy agreed to pay a cash bonus and conduct more than 60 line-miles of seismic survey on the Rio Tame block during the rest of 1984.

The company has the option to drill a 10,000 ft wildcat to test the Mirador and Guadalupe formations to earn 75% of the farmors' interests.

The Eocene Mirador and the Cretaceous are productive in Oxy's Cano Limon complex about 31 miles north-northeast of the Rio Tame block.

Bonanza 30%, Bluesky 20%, and Leed 50% also hold the 432,250 acre Rio Ariporo association contract, a south offset to the Rio Tame block.

BP-Exxon-Jackson. Subject to approval by Ecopetrol, BP will earn a 10% interest and Exxon a 40% interest in Jackson's Capanaparo Sur block. Jackson will retain the remaining 50% interest.

BP's second agreement with Jackson covers acquisition of a 20% interest in the Rio Lipa and Capanaparo blocks. It also is subject to approval by Ecopetrol.

Jackson will retain a 30% interest in each contract area.

Ecopetrol approved Sun Oil of Columbia Inc., which holds 50% interests, as operator of both blocks.

Sun has launched a 248 line-mile seismic program on the Capanaparo block. That, added to an earlier survey by Jackson, will give the group 838 line-miles of data acquired on the block in 1984.

Heavy oil. Texaco Inc.'s Colombian subsidiary and state owned Empressa Colombiana de Petroles (Ecopetrol) planned to drill 40 wildcats and development wells in 1984 in the Nare and Cocorna contract areas.

The program was expected to boost production from heavy oil area to about 13,000 b/d by yearend 1984 and 20,000 b/d in 1985.

Teca field on the northern end of the Cocorna area produces about 5,000 b/d from 51 wells. The field, declared commercial in 1981, uses cyclic steam stimulation to boost production.

Texas Petroleum Co. (Texpet), operator, and Ecopetrol signed association contracts for the 383,274 acre Nare area and 124,444 acre Cocorna area in September 1980. The partners hold a 50-50 interest in the Magdalena Valley

Maximum depth of the north coast directional wells is "frequently 2,000-3,000 m" (6,562-9,842 ft). But some pay is as shallow as 459 ft.

Average time between rigging up and the start of production is said to be 6 months.

Drilling is carried out with Soviet manufactured rigs and turbodrills with the help of Soviet personnel. During 1981-82 alone, the U.S.S.R. shipped nearly $46 million worth of rigs and other exploration/development equipment to Cuba.

Cuba's fields. Cuba's biggest fields before the revolution—Jatibonico and Cristales—were found in the island's central sector, well away from the north coast, during 1954-56.

Oil discoveries along Cuba's north coast date back to 1881, when Motembo field was found just east of the La Palma River.

More than 90 miles from Havana, it apparently is the easternmost of the North Cuban basin strikes.

Bacuranao and Cruz Verde fields, the closest to Havana, were discovered in 1914.

Guanabo, just east of Havana, was found in 1957.

It was, for a time, by far the best producer among North Cuban basin fields, with one well flowing 1,497 bbl in 9 hr early in 1968.

But Guanabo, like other discoveries in the North Cuban basin, is a serpentine plug field. These fields are quite small and often have little long term potential despite high initial flows from some wells.

It's pointed out, however, that the North Cuban basin is large, extending for more than 620 miles along the coast. The basin is 60-93 miles wide, of which a narrow strip only 6-37 miles wide is onshore.

One Cuban/Soviet study said Varadero is the largest field in the North Cuban basin.

Varadero's oil and gas are produced from Upper Jurassic-Lower Cretaceous limestone. Small accumulations also have been found in the Upper Cretaceous.

At least two other oil fields are located very close to Varadero. All three are on structures that extend offshore.

East of Varadero, Cuban/Soviet crews during the 1960s drilled at least four deep dry holes in the Sabana-Camaguey Archipelago.

A hole on Cayo Fragoso reportedly reached 16,446 ft, and another on Cayo Frances went to 14,881 ft. A well on Cayo Romano was targeted to 16,405 ft. As early as 1970, Soviet sources said the U.S.S.R. would help drill a wildcat from a fixed platform in very shallow water off Cuba's north coast. No further information on the project has been disclosed.

MEXICO

CAPITAL: **Mexico City**
MONETARY UNIT:
Peso
REFINING CAPACITY:
1,269,000 b/cd
PRODUCTION:
2,743 Mb/d
RESERVES:
48,600,000 Mbbl

MEXICO'S PRESIDENT Miguel de la Madrid unveiled a new national energy program (NEP) for 1984-88 designed to increase energy production and conservation.

NEP's objectives include the pursuit of energy self-sufficiency, energy conservation, and diversification of energy sources.

To encourage energy conservation, prices and tariffs of government produced goods and services will be adjusted, although domestic prices of refined products will remain below world levels for the time being.

Energy resources. Boosting the use of nuclear energy, hydropower, and coal for electric power generation will be a top priority in an effort to diversify energy sources. Geothermal's contribution to the national energy mix also will rise.

Production of solid fuels, including coal and uranium, will grow substantially.

De la Madrid said state owned Petroleos Mexicanos will continue to sell crude oil only under contract at a uniform price to all customers.

It will not participate in the spot market.

Crude oil sales to a single country will be limited in most cases to 50% of total Mexican crude exports, and the share of Mexican oil in a single country's total imports will not exceed 20%.

Exceptions will be signers of the renewed San Jose accord that provides oil to Central American and Caribbean countries under preferential terms.

Exports of crude oil were to remain at about 1.5 million b/d in 1984, but exports of refined products were expected to decline due to an increase in domestic demand.

The energy sector provided almost 75% of total export revenues and 38% of government income in 1983.

De la Madrid said the energy sector will generate a surplus of $68 billion in foreign exchange during the 1984-88 period.

Mexico's production of primary energy increased 400% during 1970-83, while power generation and refinery capacity tripled.

Mexico production

	1983	1984	1985-88
	— 1,000 b/d	—	(%/year)
Crude oil	2,665.5	2,750	2.5-3.5
LPG	154.9	170	9-10
Gasoline	355.2	370	6-7
Diesel fuel	224.0	240	5-6
Fuel oil	350.2	380	6.5-7.5
Natural gas liquids	265.2	292	5-6
Natural gas (MMcfd)	4,053.6	3,900	1.5-2

Source: Petroleos Mexicanos

Hydrocarbon reserves climbed to 72.5 million bbl of oil equivalent from 5.5 million, De La Madrid said.

In addition, the country holds 643 million tons of coal and 10,600 tons of extractable uranium.

Pemex operations. During 1984-88, Pemex will drill 400 wildcats, about 10% offshore, and 900-950 development wells, 10-15% offshore.

Exploration efforts will focus in the Campeche basin, the Chiapas-Tabasco area, the Lacandona jungle and Simojovol in South Chiapas, the Papaloapan basin, the border area of Durango and Chihuahua, and the Altar Desert in Sonora.

The newest rig on the scene is Salen-Protexa Co.'s Zapoteca jack up, operating with five other rigs in the Campeche basin's Yum exploration area, 17 miles northeast of Frontera City in Tabasco state.

Pemex plans to install nine platforms, each with 12 slots, in KuMaloob, Abkatun, Chuc, and Pol fields.

Pemex production was expected to be 2.7 million b/d of oil and 3.9 billion cfd of gas in 1984.

Production rose slightly during the first half of 1984, while gas production slipped.

However, gas volume in net terms was about the same as 1983 due to a significant reduction in offshore gas flaring.

Flaring represented 10.7% of total gas production in 1983.

That figure will be reduced to about 3-4% by yearend 1984 and to 2% by 1988.

For the rest of the NEP period, De la Madrid expects oil production to rise 2.5-3.5%/year, while gas production will rise 1.5-2%/year.

During that time, Pemex plans to complete construction projects at the Salamanca, Poza Rica, Tula, and Salina Cruz refineries. This should result in boosting Mexico's refining capacity by about 400,000 b/d to 1.7 million b/d in 1988.

PERU

CAPITAL: **Lima**
MONETARY UNIT:
Sol
REFINING CAPACITY:
175,560 b/cd
PRODUCTION:
201 Mb/d
RESERVES:
670,100 Mbbl

PERU'S PETROLEOS DEL Peru (Petroperu) is seeking new exploration contracts with oil companies in a campaign to boost declining investment in the country's petroleum sector.

Energy and Mines Minister Juan Inchaustegui said the aim is to more than double investment, which has been running at less than $350 million/year, compared with $521 million in 1982. He estimated that at least $800 million/year will be required to maintain self-sufficiency.

Petroperu's figures show that oil reserves have fallen from a high of 835 million bbl in 1981 to 696.3 million bbl at yearend 1983. Production averaged 181,666 b/d of crude oil during first half 1983, slipping from about 195,000 b/d for the full year 1982. Domestic demand is about 120,000 b/d, down from 135,000 b/d due to recession.

New exploration pacts will cover the Huallaga, Madre de Dios, and Rio Santiago basins, which geologists consider to be the three main potential oil bearing jungle basins yet to be explored.

There also is some interest in the Titicaca basin northwest of Lake Titicaca and south of the town of Cuzco.

Exploration programs. While contract negotiations continue, so does exploration—albeit at a slower pace than in previous years—in the jungle and on the northern coast.

A group led by Union Texas, which signed a 30 year risk contract, is taking bids for construction of a camp to support the drilling of the group's first wildcat in Block 6 early next year. The area is a neighbor to Oxy's northern jungle acreage.

Royal Dutch/Shell is moving into the second 2 year stage of its jungle exploration program. It has been exploring in Blocks 38 and 42 of the south central jungle since mid-1981.

The company, in association with its 30% partner Phillips Petroleum Co., spent about $80 million in the first stage.

It is committed to spend at least another $30 million during the next 2 years. Shell is required to shoot at least 1,250 line-km of seismic survey and to drill four wells during that period.

Seismograph Services Ltd., London, is conducting the seismic work for Shell, including data processing to be done in Lima.

Shell has not reported a commercial discovery in its first exploration stage. However, the second of two wildcats completed by Shell since it started exploration, the San Martin 1-X, was a small gas find, which the company says could indicate oil at a lower level.

On the northern coast, the long awaited $241 million project to revive Petroperu's old Laguna-Zapotal fields in the Talara area got under way, financed via an $81.5 million credit authorized by World Bank.

Belco is moving ahead with its $50 million offshore exploration program with Zapata Offshore Co.'s Zapata Explorer jack up. Zapata Explorer spudded its third wildcat during first half 1984. The first well was dry, and the second, an 80 b/d discovery, was noncommercial. Petroperu was limiting exploration to seismic surveys in Blocks 8, 31, and

Breakout of spending, reserves, production in Peru

	1979	1980	1981	1982	1983	*1984
	Million $					
EXPLORATION/DEVELOPMENT SPENDING						
Contractors						
Occidental	126.5	80.3	159.7	178.5	104.0	56.7
Belco	51.6	39.4	83.3	74.1	50.4	82.4
Oxy-Bridas	161.0	150.9	141.4	62.6	1.1	9.0
Others†	12.7	35.0	78.6	5.5		
Subtotal	**339.1**	**270.6**	**397.1**	**350.2**	**234.1**	**153.6**
Petroperu	29.9	45.1	116.8	170.8	115.2	188.4
Total	**369.0**	**315.7**	**513.9**	**521.0**	**349.3**	**342.0**
EXPLORATION SPENDING						
Petroperu						
Seismic	1.2	4.5	14.7	17.9	8.5	14.4
Drilling	2.6	5.0	7.1	15.8	13.6	17.3
Subtotal	**3.8**	**9.5**	**21.8**	**33.7**	**22.1**	**31.7**
Contractors	3.9	2.8	44.0	84.8	88.1	58.8
Total	**7.7**	**12.3**	**65.8**	**118.5**	**110.2**	**90 5**
CRUDE OIL RESERVES						
Petroperu, direct operations	Million bbl					
Coast	—	89.9	127.5	122.3	116.0	—
Central jungle	—	8.0	6.1	5.9	5.4	—
Northern jungle	—	156.8	141.5	127.1	111.4	—
Petroperu contracted operations						
Continental shelf	—	74.4	107.7	111.7	106.9	—
Coast	—	132.2	125.4	118.6	99.7	—
Jungle	—	326.7	313.8	289.4	256.9	—
Unassigned	—	13.3	13.3	—	—	—
Total	—	**801.3**	**835.3**	**775.0**	**696.3**	—

CRUDE OIL PRODUCTION	1982	1983	June 1984
	b/d		
Petroperu			
Northern coast	24,465	15,634	23,400
Northern jungle	27,965	30,961	39,200
Central jungle	862	845	—
Subtotal	**53,292**	**47,440**	**62,600**
Contractors			
Oxy-Bridas, northern coast	18,712	13,222	12,100
Belco, offshore	27,643	24,413	25,200
Oxy, northern jungle	95,915	86,032	87,100
Subtotal	**142,270**	**123,667**	**124,400**
Total	**195,156**	**171,107**	**187,000**

* Estimated. † Shell, Superior, and Hamilton.

Source: Petroperu

International seismic crew count

	1978 Land	1978 Marine	1978 Total	1979 Land	1979 Marine	1979 Total	1980 Land	1980 Marine	1980 Total
	(Average crews operating)								
United States	328	24	352	382	31	413	502	38	540
Canada	82	2	84	64	2	66	75	3	78
Mexico	24	3	27	26	3	29	29	3	32
Central & South America	47	7	54	51	9	60	65	7	73
Europe	42	11	53	49	13	62	60	23	83
Middle East	39	1	40	33	2	35	40	4	44
Africa	64	10	74	53	5	58	64	7	71
Far East	49	9	58	48	14	62	59	20	79
Total	**675**	**67**	**742**	**706**	**79**	**785**	**895**	**105**	**1,000**

	1981 Land	1981 Marine	1981 Total	1982 Land	1982 Marine	1982 Total	1983 Land	1983 Marine	1983 Total	1984* Land	1984* Marine	1984* Total
	(Average crews operating)											
United States	644	45	689	512	57	569	430	49	479	440	46	486
Canada	66	5	71	63	5	68	72	7	79	89	3	92
Mexico	29	3	32	29	1	30	28	1	29	28	0	28
Central & South America	91	8	99	98	7	105	81	5	86	80	8	88
Europe	66	29	95	69	31	100	71	26	97	82	39	121
Middle East	45	4	49	43	3	46	33	1	34	31	1	32
Africa	82	7	89	70	6	76	60	10	70	57	5	62
Far East	79	13	92	103	16	119	95	15	110	93	16	109
Total	**1,102**	**114**	**1,216**	**987**	**126**	**1,113**	**870**	**114**	**984**	**900**	**118**	**1,018**

*First half.
Source: Society of Exploration Geophysicists

in terms of 1979-81 expectations—they were actively seeking ways to cut costs. And that helped geophysical contractors.

Seismic surveys are expensive, but drilling wells in the wrong place is more so. So many operators, especially major oil firms, were increasingly relying on seismic surveys to target their drilling.

That was a boon to three dimensional (3D) seismic technology during 1984. Especially in geologically complex areas such as the Overthrust Belt of the U.S. West, operators used 3D surveys in field development to pinpoint expensive drilling.

Operators also were making increasing use of vertical seismic profiles (VSP), in which geophones were lowered into well bores to detect energy from surface sources. VSPs were proving valuable in velocity determinations and in assessing strata below total depths of the holes over which they were shot.

They were particularly helpful in conjunction with data volumes compiled in 3D surveys.

However cheaper 3D surveys were than drilling misplaced holes, they nevertheless remained expensive themselves. And they were running into a new problem.

Seismic operations in general were encountering new environmental scrutiny during 1984. And 3D seismic surveys, because of the concentrated coverage they provided, required much surface activity and thus were a focal point

The industry looks at Wyoming proposals

Wyoming's proposals for strict regulation of seismic operations drew much industry attention in 1984.

The state is a busy area for seismic contractors. Complex geology in its mountainous producing areas requires operators to rely on seismic data to target drilling.

In 1983, industry conducted 13,303 miles of seismic survey in the state, drilling more than 87,000 shot holes totaling more than 10 million ft.

State officials expected 1984 totals to keep pace.

And they were worried about the activity's effects on water resources and the environment.

After a series of hearings, the state Oil and Gas Conservation Commission proposed Rule 339 governing geophysical operations.

Contractors said the rule in its original form would have shut down seismic operations. State officials said the regulations were necessary because contractors had ignored prior shot hole plugging requirements and thus were endangering drinking water and land.

During 1984, the state held a series of hearings on proposals to amend the rule, which required contractors to post bond of $50,000 for each permit, twice the original amount.

At yearend, the commission was considering a proposal that included these requirements:

- When using charges heavier than 50 lb/shot for surface shots within 1 mile of an inhabited building, the contractor would have to obtain written permission of the building's owner. Persons living within 2 miles of the shot would have to be notified.
- A contractor during Nov. 1-May 1 would have to use coarse ground sodium bentonite as the shot hole plugging material.
- A contractor would have to disburse excess cuttings to within 1 in. of plugged shot holes and leave a short section of lath from the holes as markers.
- Plugging operations would have to begin within 30 days of the start of shot hole drilling. ▪

Worldwide oil and gas at a glance

COUNTRY	ESTIMATED PROVED RESERVES 1-1-1985		OIL PRODUCTION			REFINING Capacity (b/cd) Jan. 1, 1985				
	Oil (1,000 bbl)	Gas (10⁹ cu ft)	Producing wells** July 1, 84	Estimated 1984 (1,000 b/d)	% change from 1983	No. of ref.	Crude	Thermal operations	Catalytic cracking	Catalytic reforming
ASIA-PACIFIC										
Australia	1,430,900	17,850	545	481.0	+ 15.3	10	696,850	—	175,500	170,020
Bangladesh	—	7,000	—	—	—	1	31,200	—	...	1,650
Brunei	1,400,000	7,300	649	160.0	+ 3.2	1	9,400	—	...	...
Burma	28,000	170	445	30.0	—	2	26,300	1,700	...	...
China, Taiwan	(c)5,700	540	78	2.6	− 7.1	2	542,510	3,933	22,600	56,400
Guam	—	—	—	—	—	1	43,700	—	...	...
India	3,500,000	15,000	1,560	543.0	+ 26.3	12	704,752	107,030	86,900	26,560
Indonesia	8,650,000	40,000	4,840	1,332.0	− 3.8	6	630,500	98,500	...	60,700
Japan	56,000	720	348	6.4	− 7.2	45	4,813,000	80,520	422,650	537,550
Korea, South	—	—	—	—	—	6	776,000	43,990	...	36,550
Malaysia	3,000,000	50,000	368	462.0	+ 25.9	4	205,000	—	...	20,600
New Zealand	(c)155,000	5,438	27	18.0	+ 20.0	1	53,000	—	...	18,000
Papua New Guinea	(c)50,000	500	—	—	—	—	—	—	...	...
Okinawa	—	—	—	—	—	3	153,000	—	...	11,500
Pakistan	82,000	15,760	38	18.0	+ 50.0	3	128,750	—	...	5,600
Philippines	16,300	12	10	12.0	− 14.3	3	286,000	—	16,100	39,400
Singapore	—	—	—	—	—	5	1,072,000	133,000	....	50,000
Sri Lanka	—	—	—	—	—	1	50,000	12,500	...	3,750
Thailand	156,000	5,900	84	19.0	+ 171.4	3	171,600	9,600	8,000	24,600
Total Asia-Pacific	**18,529,900**	**166,190**	**8,992**	**3,084.0**	**+ 0.5**	**109**	**10,393,562**	**490,773**	**731,750**	**1,062,880**
WESTERN EUROPE										
Austria	118,500	530	1,243	23.0	− 4.2	1	273,000	18,000	27,000	33,000
Belgium	—	—	—	—	—	5	692,500	51,600	100,200	92,420
Cyprus	—	—	—	—	—	1	16,000	—	...	3,400
Denmark	400,000	3,500	32	45.0	+ 4.7	3	176,000	72,500	...	29,700
Finland	—	—	—	—	—	2	299,000	45,500	37,500	48,000
France	148,000	1,500	550	35.0	—	17	2,386,000	119,000	279,950	310,000
Germany, West	299,000	5,957	3,136	79.0	− 2.5	25	2,171,600	331,800	179,700	385,850
Greece	51,000	3,440	—	27.0	+ 12.5	4	390,000	19,520	23,000	30,300
Ireland	—	800	—	—	—	1	56,000	—	...	11,000
Italy-Sicily	800,000	4,360	140	45.0	—	23	3,095,200	309,630	279,500	340,400
Netherlands	310,000	68,482	633	61.0	+ 15.1	7	1,498,500	174,900	122,500	171,900
Norway	8,300,000	89,000	171	688.0	+ 12.8	4	244,200	67,000	...	29,000
Portugal	—	—	—	—	—	3	289,922	—	10,096	38,169
Spain	115,000	700	42	45.0	− 22.4	10	1,493,000	129,400	103,500	179,700
Sweden	—	—	—	—	—	6	439,000	69,000	24,000	73,500
Switzerland	—	4	—	—	—	2	127,000	24,000	...	25,000
Turkey	294,000	600	440	41.0	− 6.8	4	460,475	—	38,600	45,057
United Kingdom	13,590,000	27,800	535	2,452.0	+ 7.0	16	2,007,700	205,000	356,500	349,500
Total Western Europe	**24,425,500**	**206,673**	**6,922**	**3,541.0**	**+ 7.0**	**130**	**15,654,622**	**1,636,850**	**1,543,446**	**2,150,839**
MIDDLE EAST										
Abu Dhabi	30,500,000	20,750	254	750.0	− 3.4	3	185,250	—	...	12,334
Bahrain	170,000	7,260	257	41.0	—	1	250,000	19,000	36,000	17,100
Divided (Neutral) Zone	5,420,000	8,290	464	420.0	+ 7.1	—	—	—	...	...
Dubai	1,440,000	4,320	141	324.0	− 3.6	—	—	—	...	...
Iran	48,500,000	478,600	530	2,166.0	− 10.7	4	530,000	80,800	...	63,845
Iraq	44,500,000	28,800	290	1,218.0	+ 36.4	8	318,500	—	...	43,500
Israel	750	8	10	0.1	—	2	170,000	62,000	18,000	24,500
Jordan	—	—	—	—	—	1	100,000	—	4,410	8,640
Kuwait	90,000,000	32,500	530	925.0	+ 6.6	5	668,600	—	...	51,000
Lebanon	—	—	—	—	—	1	17,000	—	...	3,100
Oman	3,500,000	7,377	555	404.0	+ 7.7	1	50,000	—	...	10,000
Qatar	3,350,000	7,377	555	404.0	+ 33.9	1	56,058	—	...	10,463
Ras al Khaimah	(c)100,000	400	2	5.8	—	—	—	—	...	...
Saudi Arabia	169,000,000	123,270	555	4,545.0	− 7.1	4	840,000	—	10,000	38,000
Sharjah	450,000	6,500	18	62.0	+ 77.1	—	—	—	...	...
South Yemen (Aden)	—	—	—	—	—	1	178,000	—	...	12,000
Syria	1,450,000	1,280	802	161.0	− 4.2	2	228,790	41,199	...	19,348
Total Middle East	**398,380,750**	**869,366**	**4,582**	**11,416.9**	**− 0.7**	**38**	**4,052,673**	**202,999**	**107,010**	**358,887**

EDITOR'S NOTE: All reserves figures except those for the U.S.S.R. (and gas for Canada) are reported as proved reserves recoverable with present technology and prices. U.S.S.R. figures are "explored reserves" which include proved, probable, and some possible. Canadian gas figure, under criteria adopted by Canadian Petroleum Association in 1980, includes proved and some probable. (c)Condensate. *U.S. reserves numbers based on Energy Information Administration estimates. †Estimates based on capacity as of Jan. 1, 1984, plus known 1984 closures and expansions. ††Includes Albania, Bulgaria, Cuba, Czechoslovakia, East Germany, Hungary, Mongolia, North Korea, Poland, Romania, Viet Nam, and Yugoslavia. **Does not include shut in, injection, or service wells.

COUNTRY	ESTIMATED PROVED RESERVES 1-1-1985 Oil (1,000 bbl)	Gas (10^9 cu ft)	OIL PRODUCTION Producing wells** July 1, 84	Estimated 1984 (1,000 b/d)	% change from 1983	REFINING Capacity (b/cd) Jan. 1, 1985 No. of ref.	Crude	Thermal operations	Catalytic cracking	Catalytic reforming
AFRICA										
Algeria	9,000,000	109,100	1,090	608.0	– 9.9	4	464,700	...	...	55,600
Angola-Cabinda	1,800,000	1,650	291	207.0	+ 16.9	1	32,100	...	...	1,900
Benin	100,000	...	6	6.9	+ 23.2	...	...	...	...	...
Cameroon	550,000	4,150	166	125.0	+ 9.6	1	43,000	...	...	6,500
Congo	480,000	2,118	246	118.0	+ 35.6	1	21,000	...	...	2,000
Egypt	3,200,000	7,000	617	790.0	+ 14.7	6	369,330	...	...	10,800
Ethiopia	...	...	...	...	...	1	14,600	...	...	1,898
Gabon	510,000	550	270	150.0	...	1	20,000	7,200	...	1,400
Ghana	3,800	4	3	0.6	– 50.0	1	28,000	...	...	5,550
Ivory Coast	108,000	3,000	19	22.0	– 8.3	2	90,073	...	...	14,600
Kenya	...	...	...	...	...	1	95,000	...	...	9,000
Liberia	...	...	...	...	...	1	15,000	...	...	2.000
Libya	21,100,000	21,200	905	1,090.0	+ 1.3	3	329,800	...	...	14,182
Madagascar	...	...	...	...	...	1	16,350	...	...	2,600
Morocco	250	...	...	0.2	...	2	79,703	...	...	13,058
Mozambique	...	...	...	...	...	1	17,000	...	...	2,500
Nigeria	16,650,000	35,600	1,177	1,414.0	+ 13.9	3	250,400	...	44,100	38,100
Senegal	...	...	...	...	...	1	29,800	...	...	2,870
Sierra Leone	...	...	...	...	...	1	10,000	...	...	...
South Africa	114,500	350	...	...	...	5	388,500	59,500	80,000	62,500
Sudan	300,000	...	...	...	...	1	23,800	...	...	1,700
Tanzania	...	200	...	...	...	1	13,500	...	...	3,000
Togo	...	...	...	...	...	1	20,000	...	...	4,400
Tunisia	1,514,000	2,224	131	114.0	– 5.0	1	34,000	...	...	3,300
Zaire	110,000	30	16	27.0	+ 12.5	1	17,000	...	...	3,000
Zambia	...	...	...	...	...	1	24,500	...	...	5,600
Total Africa	**55,540,550**	**187,176**	**4,937**	**4,672.7**	**+ 6.6**	**43**	**2,447,156**	**66,700**	**124,100**	**268,058**
WESTERN HEMISPHERE										
Argentina	2,266,000	24,628	8,189	467.0	– 2.5	11	678,400	121,600	102,500	37,700
Bahamas	...	...	...	...	...	1	350,000	...	...	...
Barbados	600	...	61	1.7	+ 54.5	1	3,000	...	...	...
Bolivia	158,000	4,270	352	20.0	...	3	46,930	...	...	14,158
Brazil	1,976,000	2,840	3,386	437.0	+ 32.8	13	1,305,100	16,200	315,400	21,600
Canada	7,075,000	92,300	39,146	1,430.0	– 1.4	27	1,868,534	79,700	401,767	349,338
Chile	736,000	2,360	266	38.0	– 2.6	2	141,000	8,400	34,000	9,300
Colombia	624,000	3,786	2,509	165.0	+ 8.6	4	211,000	61,000	91,000	6,000
Costa Rica	...	...	...	...	...	1	15,600	...	...	1,500
Dominican Republic	...	...	...	...	...	2	44,000	...	...	8,300
Ecuador	1,400,000	3 000	...	254.0	+ 8.1	3	82,282	11,550	11,550	2,513
El Salvador	...	...	...	...	...	1	16,300	...	...	2,800
Guatemala	500,000	30	8	5.2	– 23.5	1	16,000	...	...	3,000
Honduras	...	...	...	...	...	1	14,000	...	...	1,800
Jamaica	...	...	...	...	...	1	35,500	...	...	3,540
Martinique	...	...	...	...	...	1	12,800	...	...	3,000
Mexico	48,600,000	77,000	...	2,743.0	+ 2.1	9	1,269,000	82,000	297,000	163,800
Netherlands Antilles	...	...	...	...	...	2	740,000	295.000	44,000	15,000
Nicaragua	...	...	...	...	...	1	15,000	...	...	3,000
Panama	...	...	...	...	...	1	100,000	...	...	7,500
Paraguay	...	...	...	...	...	1	7,500	...	...	...
Peru	670,100	1,100	4,083	201.0	+ 17.5	6	175,560	...	21,670	1,680
Puerto Rico	...	...	...	...	...	2	121,000	....	12,000	5.800
Suriname	...	...	12	0.5	...	...	...	...	...	...
Trinidad & Tobago	540,000	10,550	3,145	169.0	+ 5.6	2	320,000	...	25,000	27,000
Uruguay	...	...	...	...	...	1	45,000	....	5,000	3,000
Venezuela	25,845,000	55,367	13,512	1,724.0	– 2.5	7	1,224,200	41,600	179,400	6,000
Virgin Islands	...	...	...	...	...	1	545,000	80,000	...	125,000
United States	*27,300,000	*198,000	615,500	8,750.0	+ 0.7	†202	†15,400,000	†1,611,705	†4,671,000	†3,476,520
Total Western Hemisphere	**117,690,700**	**475,231**	**690,169**	**16,405.4**	**+ 1.4**	**308**	**24,857,706**	**2,368,755**	**6,211,287**	**4,298,849**
Total non-Communist	**614,567,400**	**1,904,625**	**715,602**	**39,120.0**	**+ 2.4**	**628**	**57,405,719**	**4,766,077**	**8,717,593**	**8,139,513**
COMMUNIST AREAS										
China	19,100,000	30,900	NA	2,250.0	+ 6.1	20	2,150,000	NA	NA	NA
U.S.S.R.	63,000,000	1,450,000	110.000	12,230.0	– 0.8	38	12,200,000	NA	NA	NA
Other††	2,000,000	16,500	NA	490.0	...	45	3,150,000	NA	NA	NA
Total Communist	**84,100,000**	**1,497,400**	**110,000**	**14,970.0**	**+ 0.2**	**103**	**17,500,000**	**NA**	**NA**	**NA**
TOTAL WORLD	**698,667,400**	**3,402,025**	**825,602**	**54,090.0**	**+ 1.8**	**731**	**74,905,719**	...	...	...

Worldwide Production

• Offshore (e) Estimated (c) Condensate (NA) Not available

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
				Flow	Artificial lift	Shut-in			
ABU DHABI(e)	AMERADA GROUP	• Arzanah, 1973	10,750	222	32	48	802,900	7,249,680,000	41.0-44.0
	CFP GROUP	• Abu Al Bukhoosh, 1972	6,400- 8,000						31.0-33.0
		• Mubarras, 1969	8,950-10,700						38.0
		• El Bunduq, 1965	8,300						40.0
	ADNOC	Asab, 1965	7,500- 7,900						41.0
		Bab, 1953	7,900- 9,900						44.0
		Bu-Hasa, 1962	7,500- 8,000						40.0
		Sahil, 1967	8,560- 9,000						41.0
		• Umm Shaif, 1958	8,500						37.0
		• Upper Zakum, 1964	9,150						39.0
		• Lower Zakum, 1964	9,100						39.0
		Total Abu Dhabi		**222**	**32**	**48**	**802,900**	**7,249,680,000**	
ALGERIA(e)	SONATRACH	Zarzaitine, 1957	4,700	NA	NA	NA	617,000	6,726,305,000	42.2
		Edjeleh, 1956	1,500- 2,800						37.2
		Tiguentourine, 1966	2,160- 4,265						44.4
		El Adeb Lareche, 1958	4,100						43.3
		Assâkaifaf N. & S., 1958	2,800						42.7
		Tan Emeliel N. & S., 1960	2,800- 4,500						42.5
		Edeyen, 1964	5,580						41.5
		Hassi Mazoula S., 1963	4,430						40.2
		Hassi Mazoula B., 1965	4,920						42.0
		Acheb W. & Kreb, 1963 & 1960	7,360						45.6
		Tin Fouye N. +F6, 1962	4,265						39.6
		El Borma, 1967	8,200						42.9
		Keskassa, 1968	8,860						42.9
		Mereksen, 1974	9,420						45.8
		Gara, 1962	9,420						42.9
		Hassi Messaoud N., 1956	10,500						45.9
		Hassi Messaoud S., 1956	10,500						46.1
		Gassi-Touil & Gassi-Touil E., 1961	6,890						50.6-50.8
		Hassi Chergui	8,200						50.6
		Nezla N., 1965	8,530						51.5
		Rhourde El Baguel, 1962	9,850						40.2
		Mesdar E. & W., 1972	11,155						40.3
		El Gassi-El Agreb, 1959	10,170						47.9
		Rhourde Nouss & E., 1972	8,530						39.7
		Tin Foye Tabankort, 1966	4,600- 6,560						41.1-41.3
		Djoua W., 1967	5,580- 6,240						41.1
		Amassak, 1970	6,565						41.1
		Tamendjelt, 1970	5,585- 6,890						41.1
		Timedratine, 1964	8,155						42.7
		Ohanet N. & S., 1960	7,878						43.8
		Askarene, 1962	8,200						41.7
		Guelta, 1962	8,960						41.7
		Stah, 1971	9,515						45.8
		Ras Toumb, 1976	9,190						35.7
		Haoud Berkaoui-Ben Kahla, 1965	11,000						43.6
		Guellala-Guellala N.E., 1969	11,320						42.2-42.3
		N'Goussa, 1974	11,715						42.2
		Kef El Argoub, 1973	12,570						42.2
		Oued Noumer, 1969	8,860						48.3
		Djorf, 1974	9,025						48.3
		Djebel Onk, 1960	3,940						37.0
		Alrar FJT	...						...
		Hassi R'Mel(c)	...						...
		Gassi Touil(c)	...						...
		Other Crude	...						...
		Condensate	...						...
		Total Algeria		**NA**	**NA**	**NA**	**617,000**	**6,726,305,000**	
ANGOLA	FINA ANGOLA	Ganda, 1975	5,010	2	...	...	1,350	2,779,343	36
		N'Z Kitona S & D, 1973	5,200- 5,670	5	..	1	3,856	11,464,566	30
		N'Z Pangala, 1973	4,997- 5,095	5	2	1	8,267	38,006,461	36
		N'Zombo, SW I, SW S, & SE S, 1973	5,245- 6,270	5	...	1	1,917	21,092,198	30.2-31
		Quenguela N., 1967	4,900- 6,200	1	21	18	3,396	33,520,000	31
		Quinfuquena I & S, 1975	6,800- 7,050	8	...	4	4,951	17,762,964	31.4-32
		Quinguila, 1972	4,100	3	8	1	7,042	23,256,068	36
		Bento, 1972	7,500	1	...	1	372	4,501,000	26
		Cabeca da Cobra, 1969	3,400	4	...	2	352	2,192,254	41

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
			Flow	Artificial lift	Shut-in			
	Pambo, 1982	4,600	4	...	1	1,222	547,012	38.8
	Luango, 1977	3,800	3	...	...	727	1,071,189	38.0
	Other	3,400- 6,500	12	4	36	3,140	41,949,225	27.5-37.4
GULF CABINDA	• Erva, 1969	10,650	1	...	...	597	3,759,775	30.2
	• Kambala, 1971	11,100	3	1	...	6,080	8,113,265	32.8
	• Kungulo, 1976	3,900	13	4	...	19,852	26,015,784	32.2
	• Limba, 1969	2,900- 8,750	3	8	3	16,295	68,683,386	31.6
	• Livuite, 1979	8,200	7	...	...	3,025	1,113,530	31.7
	• Malongo N., 1966	1,500- 8,500	5	56	8	17,161	191,697,598	29.6
	• Malongo S., 1966	1,300- 1,600	2	27	4	7,766	61,149,201	25.1
	• Malongo W., 1969	1,800- 6,900	5	19	14	18,350	208,536,509	22.5
	• Takula, 1982	4,000- 6,350	38	...	1	60,596	25,951,437	31.5
TEXACO	• Cuntala, 1978	7,000- 7,500	...	1	...	378	1,980,296	34.0
	• Essungo, 1975	6,500- 6,750	10	...	...	9,531	11,386,745	37.0
	Total Angola		**140**	**151**	**98**	**196,223**	**806,529,806**	
ARGENTINA*	Chubut, 1907	1,968- 9,168	23	1,932	114	90,682	886,949,862	21.1-26.0
	Jujuy, 1969	2,461-16,732	6	...	2	1,247	59,257,360	46.5-47.0
	La Pampa, 1968	3,609- 4,921	3	174	2	9,431	64,266,408	31.0
	Mendoza, 1932	2,178-16,778	26	1,041	34	112,738	947,577,927	23.7-32.0
	Neuquen, 1918	1,312-12,498	201	680	13	70,363	400,983,632	24.0-41.0
	Rio Negro, 1960	2,953- 7,546	63	783	22	46,739	386,396,769	22.5-41.0
	Salta, 1928	6,551-15,092	29	9	10	11,908	105,238,946	39.0-59.0
	Santa Cruz, 1946	1,468-17,060	102	2,943	104	108,669	860,270,751	21.1-30.0
	Tierra del Fuego, 1959	5,249- 7,824	95	78	10	22,145	126,450,902	43.4-46.0
	Formosa, 1984	11,466-11,490	1	...	...	488	88,771	42.0-42.9
	Total Argentina		**549**	**7,640**	**311**	**474,410**	**3,837,481,328**	
AUSTRALIA **ESSO-BHP**	• Barracouta,[c] 1968	4,550	...	2	...	5,160	27,626,000	62.8
	• Cobia, 1972	7,700	7	...	...	26,050	11,214,000	44.6
	• Halibut, 1967	7,700	10	...	9	64,000	594,657,000	43.3
	• Kingfish, 1967	7,500	13	20	14	84,700	865,037,000	46.9
	• Mackerel, 1969	7,700	17	...	1	108,180	224,648,000	45.6
	• Tuna, 1968	6,500	20	...	7	10,200	22,089,000	40.5
	• Snapper, 1968	4,350	14	1	3	7,300	4,852,000	47.0
	• Marlin,[c] 1966	5,100	...	1	3	11,520	41,738,000	50.0
	• W. Kingfish, 1968	7,500	15	...	1	28,890	11,977,000	46.9
	• Fortescue, 1978	7,700	11	...	3	86,970	22,110,000	43.0
INTERNATIONAL OIL	Alton, 1964	6,000	...	5	2	48	1,851,252	50.5
	Bennett, 1965	5,330	...	1	...	5	109,054	45.0
	Cabawin, 1961	5,800	1	...	...	14	46,997	49.0
	Moonie, 1961	5,800	...	14	18	636	20,824,965	44.5
WAPET GROUP	Barrow Island, 1964	1,200- 6,700	...	360	NA	20,000	200,000,000	36.9
HARTOGEN GROUP	Borah Creek, 1982	4,860	1	...	...	20	4,868	38.0
	Kincora, 1980	4,800	4	3	5	170	184,678	35.0
	Sandy Creek, 1982	4,840	1	...	...	15	2,089	42.0
	Waratah, 1982	5,350	1	3	...	200	72,515	33.0
SANTOS GROUP	Tirrawarra, 1970	9,600	20	...	...	3,900	2,301,353	52.0
OCCIDENTAL	Harriet, 1983	5,400	NA	NA	5	NA	NA	38.0
	Total Australia		**135**	**410**	**71**	**457,978**	**2,051,346,771**	
AUSTRIA **MOBIL**	Voitsdorf, 1963	7,000	3	21	11	801	20,853,535	36.0
	Sattledt, 1971	5,700	...	13	1	633	4,260,039	37.0
	Kemating, 1979	6,100	...	7	...	1,298	2,340,703	34.0
	Gaiselberg, 1938	5,200	...	33	28	828	31,150,396	25.0
	Other	...	2	65	35	1,882	23,545,228	31.0
OEMV[e]	Hochleiten, 1974	3,100- 5,000	42	1,057	287	18,558	550,957,000	21.3
	Matzen, 1949	6,100						25.7
	Pirawarth, 1947	1,600- 6,500						28.4
	St. Ulrich, 1938	1,600- 4,300						31.1
	Other	...						...
	Total Austria		**47**	**1,196**	**362**	**24,000**	**633,106,901**	
BAHRAIN **BANOCO**	Awali, 1932	1,850- 4,600	155	102	45	42,000	735,000,000	33.0
	Total Bahrain		**155**	**102**	**45**	**42,000**	**735,000,000**	
BARBADOS **BARB. NOC**	Woodbourne, 1966	6,500	18	43	34	1,670	2,453,766	30.5
	Total Barbados		**18**	**43**	**34**	**1,670**	**2,453,766**	
BENIN **SAGA**	Seme, 1968	6,232	...	6	...	6,900	2,876,843	22.6
	Total Benin		**—**	**6**	**—**	**6,900**	**2,876,843**	

*Total output by YPF and all contract producers by provinces.

PRODUCTION BY FIELDS

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
				Flow	Artificial lift	Shut-in			
BOLIVIA	**YPFB**	Camiri, 1927	3,936	13	70	...	615	47,880,153	55.0
		Carand, 1960	3,940	27	14	...	933	53,559,261	60.0
		Colpa, 1961	9,184	17	...	...	514	17,623,343	65.0
		Monteagudo, 1966	4,592	14	25	...	2,056	29,465,933	41.0
		La Pena, 1965	8,856	24	...	...	2,036	20,171,197	43.0
		Palmar, 1964	10,758	7	...	...	346	1,491,098	65.0
		Rio Grande, 1961	9,512	40	...	...	4,476	55,774,375	62.0
		Vuelta Grande, 1978	8,220	4	...	...	1,163	375,487	67.0
		Espino, 1979	14,655	2	...	...	286	837,011	56.2
		Other	...	15	50	...	1,090	30,167,458	...
	OCCIDENTAL(c)	Tita, 1976	6,450	11	1	...	591	3,962,230	70.5
		Porvenir, 1978	9,600	6	...	...	5,425	5,500,602	69.5
	TESORO(c)	La Vertiente, 1977	10,827	7		...	1,362	2,461,849	64.1
		Escondido, 1980	11,292	3		...			60.0
		Taiguati, 1981	10,174	1	...	...			63.0
		Los Suris, 1981	13,576	1	...	...			50.0
		Total Bolivia		**192**	**160**	**...**	**20,893**	**269,269,997**	
BRAZIL*	**ALAGOAS**	Furado, 1969	4,440- 5,500	8	33	...	2,636	10,610,070	35.0
		Pilar	NA	11	1	...	2,545	1,384,480	NA
		Tabuleiro de Martins, 1957	NA	...	20	...	797	2,951,873	27.0
		Other	...	4	6	...	495	1,201,218	...
	BAHIA	Agua Grande, 1951	820- 4,265	28	96	...	7,835	266,185,308	40.0
		Aracas, 1965	3,280-8,856	15	105	...	10,870	98,853,572	41.0
		Buracica, 1959	1,476- 1,840	...	165	...	7,502	126,215,810	35.0
		Faz. Imbe, 1964	2,130- 5,575	1	30	...	1,809	12,778,434	40.0
		Faz. Boa Esperanca, 1966	7,215- 8,036		13	...	1,057	14,017,555	39.0
		Faz. Pamelas, 1962	NA	...	12	...	968	5,677,995	37.0
		Malombe, 1966	3,280	...	19	...	607	6,264,560	41.0
		Mata/Remanso, 1971	4,445- 4,560	13	43	...	2,399	16,119,992	35.0
		Miranga, 1965	3,280- 3,936	7	152	...	10,899	165,060,736	40.0
		Rio Dos Ovos, 1979	NA	...	10	...	363	1,480,226	35.0
		Santana, 1962	NA	...	6	...	334	5,175,248	37.0
		Sesmaria	NA	4	17	...	1,356	1,317,042	NA
		Candeias, 1941	3,280- 7,415	6	29	...	2,826	74,196,905	30.0
		Cassarongongo, 1959	1,475- 4,755	...	17	...	749	12,970,375	32.0
		Dom Joao Terra, 1947	NA	...	50	...	1,204	19,041,268	38.0
		Riacho da Barra	NA	12	12	...	4,436	807,353	39.0
		Taquipe, 1958	3,115- 3,935	6	56	...	4,456	78,600,027	40.0
		● Candeias Mar	NA	2	10	...	778	6,158,376	30.0
		● Dom Joao Mar, 1947	920	1	279	...	6,067	74,871,162	38.0
		● Ilheus, 1979	NA	...	1	...	20	825,749	41.0
		Other	...	23	86	...	8,155	21,547,532	...
	CEARA	Faz. Belem, 1980	NA	...	178	...	1,467	921,500	13.0
		● Curima, 1978	6,888	12	...	...	9,048	8,783,164	32.0
		● Xareu, 1977	5,717- 5,766	14	1	...	5,955	4,984,867	39.0
		● Atum, 1983	...	10	...	...	5,444	990,801	25.0
		● Espada, 1983	...	5	...	...	2,226	405,139	26.0
	ESPIRITO SANTO	Faz. Cedro, 1962	5,248	...	8	...	751	8,375,036	28.0
		Sao Mateus, 1969	NA	...	19	...	1,740	1,830,862	27.0
		Lagoa Parda, 1977	5,576	13	27	...	8,382	13,291,146	30.0
		Rio Itaunas, 1977	NA	2	25	...	1,782	1,814,968	28.0
		● Cacao, 1978	9,184	3	2	...	3,655	6,767,793	32.0
		Lagoa Suruaca, 1982	...	10	...	...	3,291	598,997	30.0
		Other	...	4	78	...	2,316	2,316,298	...
	RIO DE JANEIRO	● Enchova, 1976	6,973- 7,885	8	...	...	46,066	37,851,000	23.0
		● Bonito, 1977	NA	9	...	...	13,744	11,565,044	27.0
		● Garoupa, 1974	11,382	2	9	...	22,526	21,086,814	30.0
		● Namorado, 1975	10,083	6	...	...	33,999	34,169,097	28.0
		● Garoupinha, 1974	12,693	2	...	...	6,398	7,596,117	30.0
		● Pampo, 1977	6,215	2	...	...	16,942	12,539,364	21.0
		● Area RJS-236, 1983	NA	1	...	...	418	76,109	28.0
		● Linguado, 1981	NA	5	...	...	23,605	11,661,562	20.0
		● Badejo, 1981	NA	4	...	...	8,932	7,596,808	28.0
		● Bicudo, 1982	NA	5	...	...	19,336	13,134,015	22.0
		● Corvina, 1983	...	5	...	...	15,522	2,825,028	27.0
		● Pirauna, 1982	...	4	...	...	12,004	2,184,769	28.0
		● Sul de Pampo, 1978	...	2	...	...	4,927	896,765	20.0
		● Cherne, 1982	...	2	...	...	6,229	1,133,647	27.0
		● Bagre, 1983	...	1	...	...	744	135,298	25.0
		● Parati, 1982	...	1	...	...	1,384	251,915	25.0
	RIO GRANDE DO NORTE	Alto do Rodrigues	NA	...	135	...	1,658	981,011	18.0
		● Ubarana, 1973	7,216- 8,365	41	...	...	11,990	24,344,663	40.0
		● Agulha, 1975	5,412	3	...	...	1,725	6,221,625	33.0
		Other	...	16	266	...	9,874	4,623,245	...
	PARÁ	● Área 1-PAS-11, 1983	...	1	...	...	1,358	247,134	41.0
	MARANHÃO	São João, 1983	...	...	1	...	22	4,007	...
	SERGIPE	Atalaia Sul	NA	3	3	...	849	2,262,919	NA
		Carmopolis, 1963	2,460	3	588	...	24,012	130,778,296	24.0
		Riachueio, 1961	1,475	...	209	...	5,016	15,237,891	28.0

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
		Siririzinho, 1967	1,640	...	117	...	4,921	27,116,675	30.0
		● Caioba, 1969	6,232- 6,890	11	1	...	4,515	26,304,762	36.0
		● Camurim, 1970	6,232	13	9	...	4,434	9,717,245	25.0
		● Dourado, 1970	3,620- 3,635	3	...	...	416	3,131,859	36.0
		● Guaricema, 1968	3,335-4,430	2	10	..	4,893	28,637,900	41.0
		● Robalo, 1973	...	2	...	...	73	13,335	30.0
*Total output by Petrobras, grouped by states		Other	...	12	49	...	1,616	3,503,616	...
		Total Brazil		**383**	**3,003**	...	**437,368**	**1,523,312,972**	
BRUNEI	SHELL	● Ampa SW, 1963	7,068- 8,155	126		71	51,087	531,800,000	41.0
		● Champion, 1970	4,300	126		36	54,115	229,500,000	23.0
		● Fairley, 1969	10,740	38		5	16,295	97,600,000	40.0
		● Fairley-Baram, 1973	9,500	...		5	...	12,400,000	40.0
		● Magpie, 1975	NA	14		..	21,551	42,100,000	31.0
		Seria, 1928	NA	345		193	29,436	943,900,000	34.0
		Other	..	...		7	942	900,000	...
		Total Brunei		**649**		**317**	**173,426**	**1,858,200,000**	
BURMA(e)	MYANMA	Chauk-Lanywa, 1902	1,500- 4,000	170	275	...	30,000	455,330,000	36.0
		Mann, 1970	1,600- 7,000						37.5
		Myanaung, 1964	2,000- 4,000						40.5
		Prome, 1965	850- 5,000						36.0
		Yenangyaung, 1902	100- 6,700						36.0
		Total Burma		**170**	**275**	...	**30,000**	**455,330,000**	
CAMEROON	ELF(e)	● Betika, 1972	5,300	138	28	4	121,210	168,550,000	42.5
		Ekoundou S., 1975	6,200						24.0
		Kole, 1974	5,500						31.0
		Kombo Center, 1976	5,900						37.0
		Kombo North, 1978	7,200						35.0
		Ekoundou Horst plus Center, 1972	7,200						29.0
		Boa, 1976	5,900						35.0
		Bavo South, 1976	5,600						29.3
		Betika S. Marine, 1979	6,300						30.0
		Ekuondou N. Marine, 1977	5,250						36.0
		Mokoko NE plus Abana, 1977	4,600						29.0
		Asoma Marine, 1973	3,600						19.0
		Kita E. Marine, 1978	6,900						40.8
		Mokoko S. Marine, 1977	3,300						17.0
		Inova Marine, 1976	6,200						32.8
	TOTAL-CFP	Moudi, 1979	5,900- 5,250	5	2	3	7,790	3,008,000	40.0
		Total Cameroon		**143**	**30**	**7**	**129,000**	**171,638,000**	

		Name of field, discovery date	Depth, feet	No. of wells capable of prod.	B/d average, first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
CANADA	ALBERTA*	Acheson, 1950	3,390	120	11,987	105,098,408	38.0
		Bantry, 1940	2,574- 3,300	169	4,698	39,046,422	...
		Bellshill Lake, 1955	2,950	289	8,232	42,525,260	...
		Bonnie Glen, 1952	3,959- 6,779	157	66,524	443,475,149	34.0-44.0
		Carson Creek N., 1958	8,787- 8,935	77	17,461	122,604,254	44.0
		Cessford, 1950	2,800- 3,028	256	3,902	25,500,296	...
		Clive, 1951	6,074- 6,208	143	6,124	41,785,407	...
		Countess, 1951	2,858- 4,272	124	8,046	51,598,509	...
		Fenn-Big Valley, 1950	3,900- 5,400	323	49,267	273,361,790	32.0
		Gilby, 1962	4,201- 7,000	129	3,517	42,019,432	...
		Golden Spike, 1949	3,570- 5,961	78	2,535	225,431,735	36.0
		Harmattan, E.	8,040- 8,558	142	8,296	63,406,633	...
		Harmattan-Elkton, 1955	8,796-10,757	68	6,432	53,523,542	...
		Innisfail, 1956	6,730- 8,440	82	5,053	66,693,934	...
		Joarcam, 1949	3,179	228	5,599	93,125,216	...
		Joffre, 1953	4,983- 6,779	154	2,985	77,011,088	...
		Judy Creek, 1951	8,307- 8,701	269	20,204	364,195,400	43.0
		Kaybob, 1957	4,870- 9,577	85	7,514	92,244,151	...
		Kaybob S., 1958	5,600-10,042	98	10,510	62,066,918	...
		Leduc-Woodbend, 1947	3,062- 5,380	735	6,376	368,537,889	40.0
		Lloydminster, 1933	1,690- 1,945	778	6,801	38,988,792	...
		Medicine River, 1954	5,435- 7,600	287	10,183	54,151,526	...
		Mitsue, 1964	5,908	291	25,343	238,369,675	43.0
		Nipisi, 1965	5,648- 5,726	281	40,768	219,292,663	41.0
		Pembina, 1953	3,000- 6,133	3,660	89,931	1,087,851,029	32.0-37.0
		Provost, 1946	2,760- 2,898	860	8,582	49,011,434	...
		Rainbow, 1965	4,994- 6,160	207	54,177	432,353,068	38.0-42.0
		Rainbow S., 1965	6,102- 6,400	48	6,964	53,604,078	...
		Red Earth, 1956	4,184- 4,878	188	4,358	29,595,545	...
		Redwater, 1948	2,012- 3,200	858	23,598	761,462,652	35.0
		Simonette, 1958	10,500	28	2,314	35,512,158	...
		Snipe Lake, 1962	8,500	93	3,226	47,998,244	...
		Sturgeon Lake S., 1953	4,912- 8,471	146	13,007	119,114,499	37.0
		Sundre, ~~1954~~	8,700- 9,000	57	3,121	31,965,754	...
		Swan Hills, 1957	8,100	764	47,037	611,105,833	40.0

	Name of field, discovery date	Depth, feet	No. of wells capable of prod.	B/d average, first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
	Swan Hills S., 1959	8,400	202	23,567	312,200,422	...
	Turner Valley, 1913	3,100- 9,150	162	3,177	21,516,383	39.0
	Utikuma Lake, 1963	5,624	118	12,209	31,142,892	...
	Virginia Hills, 1957	9,210	157	13,922	124,421,207	34.0
	Wainwright, 1925	1,903- 2,200	613	7,883	53,516,393	...
	Westerose, 1952	6,818	23	22,806	104,539,645	...
	Willisden Green, 1956	5,157	716	10,548	100,605,355	...
	Wizard Lake, 1951	4,044- 5,973	42	40,537	289,135,227	...
	Zama	3,702	213	8,133	65,786,477	33.0-37.0
	Other	...	9,712	287,728	1,192,405,211	...
BRITISH COLUMBIA†	Boundary Lake, 1957	3,418- 4,575	358	12,210	152,500,226	40.0
	Other	...	439	24,565	220,850,262	...
MANITOBA†	All fields	...	1,212	13,402	142,654,018	...
SASKATCHEWAN†	Steelman, 1950	4,600	559	10,627	239,391,763	27.0
	Weyburn, 1955	4,600	620	13,075	262,130,042	28.0
	Other	...	11,656	153,378	1,388,366,654	...
ONTARIO	All fields	...	...	1,500	59,763,637	...
NEW BRUNSWICK	All fields	...	...	...	798,000	...
NORTHWEST TERRITORIES	All fields	...	72	2,142	26,866,434	...
	Total Canada		**39,146**	**1,256,081**	**11,252,228,631**	

*Does not include experimental, synthetic, or condensate.
†Up to May 1, 1984.

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
CHILE	**ENAP-MAINLAND**	Canadon, 1962	6,090	96	8	238	6,227	145,000,000	38.4
		Daniel, 1960	5,806						25.4
		Daniel Este, 1961	5,523						25.0
		Dungenes, 1962	5,251						28.6
		Posesion, 1960	5,622						63.6
	TIERRA DEL FUEGO	Calafate, 1955	6,045	55	21	211	7,472	116,700,000	49.3
		Catalina Sur, 1961	5,779						44.0
		Cullen, 1954	5,730						41.8
		Tres Lago, 1957	5,724						40.1
	STRAIT OF MAGELLAN	● Ostion, 1977	7,156	34	52	18	25,557	47,700,000	33.0
		● Posesion, 1977	6,727						34.5
		● Spiteful, 1977	6,298						34.5
		● Spiteful Norte, 1978	7,150						39.0
		Total Chile		**185**	**81**	**467**	**39,256**	**309,400,000**	
CHINA, TAIWAN	**CHINESE PETROLEUM**	Tiechengshan,(e) 1959	...	28	...	5	1,834	13,616,655	51.0
		Chingtsohu,(e) 1967	...	7	...	5	141		50.0
		Yunghoshan,(e) 1971	...	5	...	2	319	5,456,709	45.0
		Other	...	38	...	15	345		50.0
		Total China, Taiwan		**78**	**...**	**27**	**2,639**	**19,073,364**	
COLOMBIA	**ECOPETROL**	Galan, 1945	3,200	...	66	18	1,451	19,968,000	19.0
		Infantas, 1918	3,200	...	290	198	2,390	220,989,000	25.8
		La Cira, 1925	3,250	...	617	159	10,654	451,882,000	24.0
		Lisama, 1957	9,500	34	59	6	7,550	26,154,000	31.0
		Llanito, 1960	7,300	...	40	10	4,044	16,109,000	21.0
		Peroles-Tesoro, 1977	4,400- 8,000	2	12	1	709	1,011,000	36.4
		Boquete, 1961	8,000	...	12	9	775	16,570,000	43.0
		Tibu, 1940	4,200	...	160	58	5,006	220,577,000	37.2
		Catnagallo, 1941	6,800	1	12	1	643	17,442,000	19.7
		Casabe, 1941	3,800	...	259	180	4,753	215,811,000	20.7
		Yarigui, 1954	8,700	2	58	5	8,544	101,236,000	19.5
		Churuyaco, 1968	8,900	4	...	...	2,544	2,758,000	31.8
		Orito, 1963	6,600	...	56	37	12,901	175,747,000	39.7
		Puerto Colon, 1965	9,600	...	4	1	934	9,286,000	30.5
		Hormiga, 1970	10,500	4	...	2	659	252,000	29.5
		Apiay, 1981	10,500	2	...	...	4,730	2,631,000	24.0
		Fayoa, 1962	8,000	17	33	[illegible]	1,780	67,619,000	27.9
		Salina, 1936	2,500	...	54	7	5,050	8,008,000	28.0
		Andalucia Sur, 1980	1,700	...	17	5	1,571	2,347,000	33.0
		Arquca, 1980	18,000	3	...	1	3,714	1,641,000	41.0
		Cocorna Asociacion	2,100	...	85	10	5,819	2,853,000	12.5
		Other	...	14	134	98	5,044	166,119,000	...
	CHEVRON	Castilla, 1969	6,500	...	14	...	7,736	7,446,519	13.5
		Rio Zulia, 1961	5,700	...	16	3	2,781	127,922,302	41.0
	TEXACO	Velasquez, 1946	7,500	...	141	8	4,743	158,897,162	19.0-24.0
		Palagua, 1954	5,000	...	127	9	4,816	79,004,835	14.0-17.0
		Cocorna, 1963	2,100	...	45	3	3,054	9,187,778	12.0-13.0
		Tisquirama, 1963	8,000	...	8	1	400	4,849,267	16.0-28.0
		Teca, 1981	2,100	...	86	11	6,004	2,917,018	12.0-13.0
	INTERCOL	Bonanza, 1963	4,000	...	...	...	811	11,560,000	30.0
		Provincia, 1962	8,000	...	...	...	8,883	138,063,000	33.0
	TENNECO	Dina, 1962	2,900	...	...	...	22,250	46,579,000	22.5
		Tello, 1972	4,200	...	...	...	11,350	25,600,000	20.2

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
	ELF	Trinidad, 1974	9,600	1	1	...	1,346	485,000	33.0
		Caño, Garza, 1979	8,000	1	1	...	770	250,000	34.0
		Caño Garza Norte, 1983	8,500	1	...	...	914	242,000	41.0
		Barquerena, 1982	10,300	1	1	...	602	256,000	34.0
		Tocaria,[c] 1980	13,000	2	...	...	75	25,000	...
		*Cravo Sur, 1982	10,300	1	...	...	...	...	38.0
		*La Gloria Norte, 1983	12,900	1	...	...	...	...	18.0
*Production began July 21, 1984.		**Total Colombia**		**91**	**2,418**	**846**	**167,910**	**2,360,364,881**	
CONGO	AGIP	● Loango, 1972	3,000	4	31	2	18,119	53,802,917	26.8
	ELF CONGO	● Emeraude, 1969	1,000	...	87	...	22,970	133,600,000	23.3
		Pointe Indienne, 1957	5,000	3	...	...	182	6,700,000	36.9
		● Likouala, 1972	4,000	28	...	...	18,375	28,200,000	33.2
		● Yanga, 1979	4,000	...	52	...	38,760	29,000,000	27.5
		Mengo, 1979	6,500	3	...	...	296	300,000	34.0
		● Sendji, 1973	4,000	...	36	...	18,815	5,900,000	27.5
		Kundji, 1980	4,000	2	...	...	233	200,000	35.8
		Total Congo		**40**	**206**	**2**	**117,750**	**257,702,917**	
DENMARK	DUC	● Dan, 1971	6,000- 6,400	13	...	5	4,800	23,600,000	30.4
		● Gorm, 1971	6,500- 7,000	18	...	2	28,700	29,950,000	34.0
		● Skjold, 1977	5,000	1	...	...	10,200	4,430,000	29.2
		Total Denmark		**32**	...	**7**	**43,700**	**57,980,000**	
DIVIDED ZONE	AOC	● Khafji, 1961	4,400-10,300	110	...	11	301,000	2,083,000,000	28.2
		● Hout,* 1969	5,300-10,500	47	...	22	19,000	236,000,000	33.0
*Includes some Khafji Ratawi zone crude (30-32°) mixed in with Hout field crude.	GETTY & KOC	Wafra, 1953	1,100- 7,000	2	283	59	46,000	1,216,550,000	18.9-23.5
		S. Fuwaris, 1963	6,300	...	6	...	1,700	20,135,000	25.0
		S. Umm Gudair, 1966	8,900	...	16	...	21,700	268,185,000	24.3
		Total Divided Zone		**159**	**305**	**92**	**389,400**	**3,823,870,000**	
DUBAI[e]	DUPETCO	● Fateh, 1966	7,900- 9,000	102	39	15	346,900	1,475,945,000	31.8
		● S.W. Fateh, 1970	7,500- 9,000						30.3
		● Falah, 1972	8,100						25.5
		● Rashid, 1973	9,400-11,500						38.0
		Total Dubai		**102**	**39**	**15**	**346,900**	**1,475,945,000**	
ECUADOR	CEPE	Ancon,* 1921	4,000	19	275	216	1,121	115,510,741	35.6
		Shuara, 1980	9,100	6	...	...	7,182	1,307,056	29.6
		Secoya, 1980	9,100	9	...	1	10,130	1,847,719	30.3
		Shushuqui, 1980	9,200	6	...	...	8,231	1,498,045	28.8
		Charapa, 1967	10,000	3	3	...	710	129,211	30.0
		Pichincha, 1983	9,000	NA	NA	NA	...	...	NA
		Other	...	...	...	...	...	4,837,000	...
	TEXACO†	Aguarico,† 1968	9,850	...	6	4	8,006	34,913,410	27.2
		Atacapi, 1968	9,855	2	1	2	3,491	9,104,257	31.0
		Auca, 1970/Auca Sur, 1980	10,578	3	14	5	13,334	47,315,320	28.0
		Lago Agrio, 1967	10,175	7	18	7	19,362	97,689,078	28.5
		Parahuacu, 1968	10,173	1	4	...	3,630	4,858,829	30.0
		Sacha, 1969	10,160	22	52	24	68,466	272,581,175	28.0
		Shushufindi,† 1959	9,772	...	41	14	90,664	380,546,283	30.0
		Yuca, 1970/Yuca Sur, 1979	10,423	1	6	...	5,081	6,684,031	28.0
		Culebra, 1973	10,626	...	1	...	272	894,125	17.5
		Yulebra, 1980	10,345	...	1	...	178	835,361	21.4
		Cononaco, 1972	11,233	5	1	...	3,188	1,964,067	33.3
		Rumiyacu, 1982	10,710	...	1	...	329	110,440	32.0
	CITY ECUATORIANA	Mariann, 1971	7,700	1	4	...	1,102	2,339,682	20.0
		Fanny,‡ 1972	7,700	3	5	...	2,660	5,370,138	22.5
*Includes Carpet and Cepeca. †Aguarico and Shushufindi now considered to be one field. ‡In unit with CEPE. City share is 65% or 1,750 b/d.		Tarapoa, 1973	8,300	...	2	...	284	561,021	20.0
		Joan, 1974	7,500	...	...	2	...	5,479	18.0
		Total Ecuador		**88**	**435**	**274**	**267,421**	**990,902,468**	
EGYPT	AMOCO	Abu Gharadig, 1972	9,500	3	10	2	7,245	35,635,000	36.0
		● El Morgan, 1965	5,100- 6,400	...	71	11	172,436	833,100,000	27.0-32.0
		● GS-382, 1977	10,500	5	...	...	9,806	27,970,000	33.9
		● July, 1973	8,100-10,000	3	19	4	78,778	355,860,000	31.0-34.6
		● Ramadan, 1974	11,300	6	13	1	89,917	293,380,000	31.7
		Razzak, 1972; & Block 350	7,700	2	10	2	3,713	46,436,000	36.0
		● SG-300, 1976	5,876	...	2	...	4,202	12,497,000	24.8
		● Shoab Ali, 1978	6,000	1	16	5	19,624	52,803,000	34.0
		● October, 1978	11,000	...	15	7	111,773	151,491,000	28.0
		● WD 33, 1972	9,800-10,800	...	1	...	368	1,941,000	32.0
		● SB 305, 1981	8,100	...	1	...	631	1,260,000	30.0
		● GS 315, 1981	6,400	6	...	1	21,059	6,590,000	29.6
		● GS 347, 1981	4,300	...	3	...	10,511	4,462,000	32.0
		● GH 376, 1981	8,600	...	4	...	4,448	1,923,000	25.0

PRODUCTION BY FIELDS

	WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells: Flow	No. of wells: Artificial lift	No. of wells: Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
		• GS 365, 1980	...	1	...	...	907	164,000	32.0
		• GS 160, 1981	...	1	...	...	60	4,000	
		• GS 336	...	1	2	...	10,370	4,029,000	26.9
	AGIP	Belayim, 1953	7,000- 8,500	1	89	12	35,090	360,808,000	22.5
		• Belayim, 1961	8,500	3	37	2	109,700	403,616,000	29.5
	PHILLIPS GROUP	El Alamein, 1966	8,700	7	8	1	2,841	63,381,918	33.6
		Umbarka, 1976	10,700	...	...	4	...	3,141,999	43.9
		Yidma, 1971	9,000	4	...	1	2,142	19,655,276	44.0
	EGPC	Amer, 1965	3,500	1	22	10	4,304	12,440,000	21.5
		Asl, 1947	3,000	3	...	2	1,221	38,733,000	21.6
		Bakr, 1958	3,200	1	45	35	3,680	94,485,000	19.0
		El Ayoun, 1968	3,300	...	5	7	365	5,799,000	24.0
		Um El Yusr	...	3	16	20	3,985	30,345,000	21.5
		Gharib, 1938	2,200- 4,500	...	90	120	5,889	242,164,000	25.5
		Sudr, 1946	2,600	1	14	5	1,253	43,650,000	21.6
		Kareem	2,215- 2,310	...	8	27	391	10,611,000	16.6
		Shukheir	2,400- 2,500	5	...	4	682	...	34.0
		Kheir	1,037	...	1	3	79	949,000	30.0
		Matarma	3,026	1	1	...	135	1,677,000	17.6
		West Bakr	1,200- 1,500	...	20	2	4,251	1,705,000	18.0
		Elkhalig	1,580	1	...	...	503	184,000	29.4
		Ras Elbehar	...	4	...	4	11,110	2,011,000	32.5
	CFP	Ras Shukheir, 1980	6,200- 6,300	1	...	2	525	1,215,000	34.5
	SUCO	• Ras Budran, 1978	11,400	7	...	...	29,200	12,831,500	26.0
		• LL 87-2, 1975	11,000	1	...	...	375	264,000	35.0
		Ras Fanar, 1978	2,300	6	...	...	8,200	1,303,000	35.0
		Zeit Bay, 1981	4,200	12	...	2	13,800	2,530,000	33.0
	BADR PETROLEUM (SHELL)	Badr el Din, 1982	NA	3	...	2	6,384	2,095,000	38.0
		Total Egypt		**94**	**523**	**298**	**791,953**	**3,105,139,603**	
FRANCE	**ALSACE**	All fields	...	2	26	13	555	2,312,594	...
		Abandoned	...	...	...	...	...	24,265,065	...
	AQUITAINE BASIN	Lacq Superieur, 1949	2,170	10	35	9	1,167	24,297,464	22.3
		Parentis, 1954	7,710	3	58	9	7,664	187,861,361	33.4
		Lugos, 1956	5,250	1	23	2	1,158	8,840,796	20.8
		Cazaux, 1959	7,550	1	43	...	5,301	61,469,333	34.2-37.3
		Lavergne, 1962	11,480	...	4	...	440	11,647,533	41.7
		Montastruc, 1973	5,200	...	4	3	337	4,774,859	32.8
		Pecorade, 1974	10,660	7	1	4	2,492	5,802,481	29.3
		Castera-Lou, 1976	9,600	...	7	1	913	1,463,463	21.7
		Vic Bilh, 1979	7,100	8	12	9	7,400	6,535,687	26.6
		Other	...	1	17	2	550	13,545,635	...
		Abandoned	...	...	...	...	...	70,857	...
	PARIS BASIN	Coulommes, 1958	6,230	...	31	15	444	12,652,970	32.6
		Châteaurenard, 1958	1,800	...	25	9	500	4,213,922	27.5
		Saint-Martin, 1959	4,590	1	12	2	374	7,903,731	33.0
		Saint-Firmin, 1960	1,800	...	35	19	821	8,985,133	27.5
		Chuelles, 1961	1,800	...	43	16	705	6,112,899	27.5
		Courtenay, 1964	2,000	...	...	...	...	...	27.5
		Soudron, 1976	4,600	...	23	2	774	1,230,054	34.4
		Donnemarie, 1979	8,040	...	3	1	764	755,894	36.2
		Chailly	5,580	...	...	...	...	...	35.4
		Chaunoy, 1983	7,350	7	...	2	4,552	1,047,958	37.1
		Other	...	4	103	38	1,731	21,862,096	...
		Abandoned	...	...	...	...	...	180,077	...
	SOUTHEAST + JURA	All fields abandoned	...	...	...	...	...	223,063	...
		Total France		**45**	**505**	**156**	**36,642**	**418,054,825**	
GABON	**ELF**	• Anguille, 1962	9,200						31.2
		• Anguille NE, 1968	7,500						32.0
		• Anguille NNE, 1971	7,500						32.0
		• Barbier, 1972	6,000						29.5
		• Breme, 1976	5,000						36.5
		Clarette, 1956	4,400						29.0
		• Girelle, 1973	9,400						32.0
		• Gonelle, 1972	5,800						24.2
		• Grondin, 1971	7,500						16.4
		• Mandaros, 1972	4,900						19.8
		Olende, 1976	6,700						33.8
		• P.G.S. Marine, 1975	7,500	202	12	116	99,700	767,203,000	32.5
		• Port Gentil Ocean, 1964	6,500						33.0
		Tchengue, 1957	4,100						26.8
		• Torpille, 1968	8,200						35.8
		• Baliste, 1974	4,900						28.3
		• M'Bya Sud, 1969	6,700						35.4
		• Anguille SE, 1962	8,200						32.8
		• Ayol Marine, 1979	7,700						22.8
		• Baudroie N., 1980	7,500						34.5
		• Baudroie Marine, 1968	7,500						33.3
		Other	...						...

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative thru to July 1, 1984	°API gravity
	SHELL/GULF/ELF	● Lucina-Marine, 1971	5,900	11		1	14,384	33,800,000	37.0
	SHELL/ELF	Gamba, 1963	3,000	31		5	7,796	143,600,000	32.4
		Ivinga, 1967	3,100	22		5	8,726	93,300,000	32.5
	AMOCO	Oguendjo*	6,000-6,500	8			19,406	5,287,536	35.0
*Started producing September 1983		**Total Gabon**		**206**		**127**	**150,012**	**1,043,190,536**	
GHANA	AGRI-PETCO	● Saltpond, 1977	8,500	3		3	600	3,044,363	36.0-39.0
		Total Ghana		**3**		**3**	**600**	**3,044,363**	
GREECE	N. AEGEAN PET. CO.	● Prinos, 1974	8,000- 8,800			...	27,490	22,902,000	30.6
		Total Greece		—	—	—	**27,490**	**22,902,000**	
GUATEMALA	ELF	Rubelsanto, 1974	5,300- 7,000		4		1,381	3,812,085	26.0-30.0
		West Chinaja, 1977	3,200- 3,800	3			2,911	5,022,388	35.0-43.0
		Caribe, 1981	6,830- 7,280	NA	1		525	585,922	22.0-24.0
		Tortugas*	2,300			2	350	68,843	25.0
		Tierra Blanca*	11,230			1	67	177,688	19.5
*Suspended as of July 1, 1984		**Total Guatemala**		**3**	**5**	**3**	**5,234**	**9,666,926**	
INDIA(e)	GUJARAT STATE	Ankleshwar, 1960	2,953- 3,937	NA	NA	NA	487,000	1,495,587,000	14.0-44.0
		Bakrol, 1968	4,593- 4,921						
		Kadi, N., 1968	2,953- 3,909						
		Kadi, S., 1968	5,906- 6,562						
		Kalol, 1961	4,265- 5,250						
		Kathana, 1965	5,250- 5,906						
		Kholka, 1966	4,265- 5,577						
		Kosamba, 1963	1,968- 2,625						
		Nawagam, 1963	4,429- 6,652						
		Sanand, 1963	4,265- 4,593						
		Sobhasan, 1968	4,429- 5,906						
		Wasel, 1963	4,265- 4,593						
	ASSAM STATE	Digboi, 1890	300- 7,500						
		Geleki, 1968	12,632-12,795						
		Lakwa, 1965	8,038-12,795						
		Moran, 1958	11,000						
		Naharkatiya, 1953	9,500						
		Rudrasagar, 1961	10,171-10,500						
	MAHARASHTRA STATE	● Bombay High, 1974	4,530- 4,630						
		Total India		**NA**	**NA**	**NA**	**487,000**	**1,495,587,000**	
INDONESIA	PERTAMINA UEP I(e)	Besitang, 1977	3,973	73	148	32	17,280	330,291,300	51.5
		Gebang, 1977	2,917						54.0
		K. Simpang, 1971	3,740- 5,019						45.0
		P. Tabuhan, 1937	3,350- 5,893						50.8
		Rantau, 1929	2,764						45.3
		Serang Jaya, 1926	3,701						47.5
		Other							...
	PERTAMINA UEP II(e)	Benuang, 1942	6,103	70	342	1,007	40,694	1,369,579,100	35.1
		Benakat East, 1973	NA						NA
		Tempino, 1931	1,647						23.0
		Gn. Kemala, 1938	5,448						38.0
		Limau, 1928	3,896- 4,626						NA
		Ogan Timur, 1943	3,793						27.42
		Talang Jimar, 1937	4,123						31.0
		T. Miring, 1935	640						NA
		Tanjung Tiga, 1938	3,750						28.0
		Kenali Asam, 1931	2,077						29.0
		Belimbing	5,371						...
		Kuang, 1940	5,249						25.1
		Other							...
	PERTAMINA UEP III(e)	Cemara, 1976	3,964- 7,104	33	55	96	12,803	92,873,400	...
		Jatibarang, 1969	3,063						29.0
		Tugu Barat, 1979	3,014						...
		Other							...
	PERTAMINA UEP IV(e)	Bunyu, 1923	2,077	32	129	173	13,181	201,662,800	33.2
		Sangatta, 1939	1,842						33.0
		Tanjung, 1938	2,296						39.9
		Tapian Timur, 1967	4,396						38.8
		Warukin S., 1966	2,067						26.9
		Other							...
	PERTAMINA UEP V(e)	Klamono, 1936	574	...	47	8	1,909	34,173,700	19.0
		Linda, 1977	3,281						19.0
		Sele, 1951	2,156						35.0

PRODUCTION BY FIELDS

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells: Flow	No. of wells: Artificial lift	No. of wells: Shut-in	Oil average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
PERTAMINA (from Stanvac)*	Sago, 1940	1,800	NA	NA	NA	NA	NA	34.0
	Lirik, 1939	1,600						34.0
	Molek, 1956	2,600						34.0
	N. Pulai, 1941	1,800						34.0
	S. Pulai, 1941	1,800						34.5
	Talang Akar, 1922	2,800						35.0
	Benakat, 1932	1,600						35.0
	Jirak, 1930	2,300						35.0
	Rayun, 1940	6,000						38.0
	Abab, 1951	6,000						36.0
CALTEX	Aman, 1974	4,700	...	10	...	3,664	5,341,566,125	36.1
	Antara, 1978	1,425	...	5	...	1,503		35.8
	Balam SE, 1972	4,500	...	13	...	937		23.2-30.6
	Balam S., 1969	1,600	...	48	...	11,328		33.3
	Bangko, 1970	1,950	...	60	15	34,108		34.1
	Batang, 1975	690	...	4	...	827		20.8
	Bekasap, 1955	2,950	...	53	3	20,011		33.5-34.1
	Bekasap S., 1968	3,900	...	10	1	1,023		34.0
	Benar, 1973	2,450	...	25	1	6,817		33.2
	Intan, 1977	3,350	...	6	...	1,370		32.8
	Jorang, 1972	5,500	...	12	3	15,763		37.9
	Kerang, 1977	3,900	...	11	2	1,742		36.7
	Kopar, 1974	5,300	...	14	...	2,254		37.5
	Kotabatak, 1952	5,500	...	64	11	27,319		28.7
	Libo, 1968	6,000	7	1	...	1,895		34.6-42.2
	Lincah, 1981	2,570	...	4	...	1,582		33.0
	Menggala N., 1968	3,850	...	14	3	7,112		32.5-33.5
	Menggala S., 1968	3,765	...	7	...	3,225		32.5-33.5
	Minas, 1944	2,600	...	379	51	299,037		35.0
	Pager, 1974	4,300	...	23	2	18,579		36.8
	Pelita, 1977	6,600	1	5	...	1,935		37.5
	Pematang, 1959	3,750	4	37	2	8,201		31.7-35.0
	Pematang Bow, 1969	5,300	...	6	1	899		31.7-35.0
	Pemburu, 1981	2,300	...	7	...	6,414		35.2
	Petani, 1964	4,750	1	29	6	13,172		32.8
	Petapahan, 1971	4,500	...	25	6	7,951		28.1
	Pinang, 1971	3,950	...	18	1	5,685		30.3
	Pudu, 1972	5,950	...	12	...	3,346		33.7
	Puncak, 1979	2,400	...	10	...	7,262		32.0
	Pungut, 1951	3,400	...	25	...	7,194		37.7
	Senin, 1972	3,000	...	22	1	8,562		34.8
	Sikladi, 1975	4,340	...	16	...	3,391		39.0
	Sintong, 1971	3,400	...	19	...	4,767		32.0
	Tandun, 1969	3,000	...	9	...	1,282		33.7
	Telinga, 1975	4,225	...	5	...	518		35.3
	Topaz, 1977	5,200	...	7	...	3,360		32.7
	Ubi, 1976	4,350	...	16	1	3,971		34.7
	Waduk, 1975	6,100	...	10	1	2,641		37.7
	Duri, 1941	770	...	725	200	87,313		21.2
	Kulin, 1970	2,050	...	49	6	7,229		20.4
	Libo SE, 1973	5,900	17	4	5	11,692		34.6-42.2
	Other	...	...	42	5	4,098		...
CAL ASIATIC TOPCO	Beruk, 1974	1,750	...	15	4	70,000	133,626,100	38.0
	Beruk NE, 1976	1,800	...	3	1			39.8
	Bungsu, 1976	2,050	...	7	...			38.2
	Kasikan, 1972	660	...	18	2			27.7
	Pedada, 1973	950	...	11	1			31.3
	Sabak, 1974	2,350	...	11	1			35.7
	Zamrud, 1975	3,650	...	31	...			40.2
	Langgak, 1976	1,360	...	12	1			31.9
	Lindai, 1971	1,100	...	14	2			30.9
STANVAC (Central Sumatra)	Binio, 1972	1,600	...	23	6	977	10,894,091	34.0
	Pekan, 1976	3,700	...	30	17	1,798	6,257,776	35.0
	Merbau, 1979	2,700	2	22	9	1,630	4,400,757	36.0
	Kerumutan, 1980	3,000	...	24	6	1,723	2,853,841	35.0
	N. Merbau, 1980	2,600	...	9	2	1,014	1,872,974	36.0
	Penduk, 1981	2,500	...	7	2	575	986,083	46.0
	Kasuara, 1982	3,700	...	6	2	1,013	1,025,555	35.0
	Other	...	...	5	1	473	134,873	...
STANVAC (South Sumatra)	Ibul, 1970	5,700	5	16	18	2,340	19,766,722	35.0
	Rambutan, 1972	4,500	8	2	12	354	3,024,924	42.0
	Other	...	4	...	7	172	671,635	...
ARCO (Java Sea)	● Arjuna, 1969	2,300- 7,250	139	78	39	182,800	462,866,800	37.0
	● Arimbi, 1972	2,943	...	11	1	2,620	19,335,700	33.0
ARCO (N.E. Kalimantan)	Sembakung,* 1976	2,600	11	6	2	6,012	13,337,400	36.0
	Bangkudulis, 1980	3,250	...	...	1	...	85,000	39.5
PHILLIPS GROUP	Salawati, 1976	5,749	...	7	6	2,698	25,249,936	39.2
ROY M. HUFFINGTON INC.	Badak, 1972	5,190-11,265	24	12	15	6,371	30,398,994	32.0
	Nilam, 1974	7,500-12,800	22	3	40	9,101	9,116,622	32.0
	Pamaguan, 1974	900- 5,500	4	7	...	1,770	2,895,449	30.0
	Badak,** 1972	3,500-15,800	61	...	...	14,687	29,728,575	42.0

[illegible]	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
			Flow	Artificial lift	Shut-in			
	Nilam,[c] 1974	7,400-13,400	33	...	...	7,843	1,677,716	42.0
	Other	...	...	...	28	68	674,944	...
TOTAL/INPEX	● Bekapai, 1972	4,600- 5,600	34	...	13	30,700	126,600,000	40.0
	● Handil, 1974	3,000- 9,000	150	2	12	155,300	451,500,000	31.0
UNION OIL	● Attaka,† 1970	7,500	27	31	12	50,658	373,728,940	39.0
	● Melahin, 1972	7,500	3	3	...	1,017	5,092,079	23.5
	● Kerindingan, 1972	7,000	2	3	3	680	4,547,921	26.0
	● Sepinggan, 1973	11,150	5	10	1	4,859	33,556,603	32.5
	● Yakin, 1976	5,100	1	9	1	1,289	6,385,835	19.0
	● Rajah, 1981	5,500	2	...	...	1,195	217,648	33.0
AARNL	Bula	280- 700	...	49	57	500	5,039,300	22.5
[illegible] (North Sumatra)	Peudawa, 1980	3,083	...	3	9	252	1,528,140	48.1
	Julu Rayeu, 1968	2,832	3	7	37	433	11,807,206	53.6
	Tualang, 1973	2,631	2	15	43	2,646	26,086,356	49.9
	Other	...	3	6	92	382	18,913,294	...
[illegible] (South Sumatra)	Kluang, 1913	2,591	10	20	48	626	1,410,392	42.6
	Ramba, 1982	3,269	19	...	15	6,974	3,044,301	37.0
	Tanjung Laban, 1982	3,732	2	...	2	733	307,528	[illegible]
	Other	...	4	10	98	626	1,947,077	...
CONOCO GROUP	● Udang, 1974	5,595	2	18	6	18,000	43,054,300	40.0
IIAPCO	● Cinta, 1970	3,500	...	46	...	15,027	153,400,699	34.0
	● Gita, 1972	5,000	...	9	...	1,416	5,898,392	34.5
	● Kitty, 1973	2,700	...	7	...	1,381	12,278,343	18.0
	● Nora, 1973	3,200	...	5	...	848	7,988,135	29.0
	● Rama, 1974	3,200	...	53	7	9,300	78,774,810	31.0
	● Selatan, 1971	4,000	...	16	3	2,193	18,153,193	19.5
	● Zelda, 1971	7,500	2	37	4	11,694	24,178,245	33.0
	● Krisna, 1979	4,500	1	38	...	14,493	45,302,750	37.0
	● Yvonne, 1980	4,500	...	6	...	1,238	3,354,851	36.0
	● Farida, 1982	8,000	...	17	...	4,461	6,045,677	32.0
	● Titi, 1982	8,000	1	3	1	352	1,613,216	33.0
	● Sundari, 1982	4,400	...	15	...	4,973	4,904,64[illegible]	25.0
	● Duma, 1983	2,300	...	3	3	367	341,2[illegible]	16.0
	● Karmila, 1983	4,800	...	6	...	25,485	6,433,963	36.0
MOBIL OIL	Arun,[c] 1971	10,050	25	...	4	94,885	158,231,682	55.0
PETROMER TREND	Canderawasih, 1976	3,500	...	9	3	1,224	10,482,777	28.1
	Jaya, 1973	3,050	...	10	2	2,472	32,169,528	41.4
	Kasim, 1973	3,350	...	24	4	6,888	39,028,811	36.6
	Walio, 1975	2,750	2	168	21	21,392	122,327,451	33.8
	Other	...	1	12	...	919	10,615,129	...
TESORO	Samboja, 1909	360- 4,380	...	27	95	666	63,691,773	21.0
	Sanga Sanga, 1897	275- 6,000	14	104	124	3,849	262,163,276	32.0
	Tarakan, 1906	200- 6,540	1	129	1,028	1,930	207,758,792	20.0
LEMIGAS	All fields, 1893-1909	2,155-2,297	5	66	348	579	130,303,500	...
	Total Indonesia		**862**	**3,974**	**3,965**	**1,519,771**	**10,671,236,698**	
IRAN[e] **NIOC**	Agha Jari, 1936	7,440	58		31	2,164,000	7,460,473,071	34.0
	Ahwaz Asmari, 1958	8,150	73		12		3,974,531,414	32.0
	Ahwaz Bangestan, 1958	12,000	...		7		145,357,152	24.3
	Bibi Hakimeh, 1961	4,570	19		14		1,673,836,286	29.9
	Binak, 1959	10,440	...		4		181,615,025	29.9
	Chillingar, 1974	3,350	...		1		6,282,095	39.3
	Chesmeh Khush, 1967	10,700	...		4		14,441,827	27.7
	Dehluran, 1972	11,900	...		6		8,763,697	34.3
	Gachsaran, 1937	3,400	46		16		5,285,575,619	31.0
	Haft Kel, 1927	1,980	2		9		1,698,148,436	37.7
	Karanj, 1963	5,360	7		...		935,426,054	33.9
	Kharg, 1961	10,900	...		...		179,191,811	31.6
	Kupal, 1965	10,500	...		7		68,598,179	32.8
	Lab-e Safid, 1968	4,350	...		7		54,020,361	35.3
	Mansuri, 1963	7,100	4		4		42,783,139	28.4
	Marun, 1963	9,400	55		57		5,089,720,168	32.6
	Masjid-e Suleiman, 1908	1,600	7		17		1,369,333,767	39.3
	Naft Safid, 1938	5,000	5		14		327,717,422	36.8
	Paris, 1964	4,670	22		5		1,060,890,863	38.8
	Par-e Siah, 1964	4,250	...		1		21,775,194	37.7
	Pazanan, 1961	7,250	44		27		313,350,427	37.2
	Rag-e Safid, 1964	7,230	19		10		694,128,057	28.6
	Ramin, 1966	12,200	...		...		1,510,105	32.9
	Ramshir, 1962	8,750	...		3		37,901,837	27.6
	Sulabedar, 1971	3,400	...		1		190,228	30.4
	Naft-e Shah, 1923	2,000- 3,000	...		...		[e]2,470,000,000	43.0
	● Bahregansar, 1960	9,000	...		...			30.0
	● Hendijan, 1968	11,000	...		...			23.0
	● Nowruz, 1966	8,200	...		...			21.0
	● Rakhsh, 1969	7,650	...		...			35.8
	● Rostam, 1966	7,000	...		...			34.4

*With Phillips, †With Inpex.
‡Included within other Pertamina districts.

PRODUCTION BY FIELDS

WORLDWIDE PRODUCTION		Name of field; discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
				Flow	Artificial lift	Shut-in			
		• Ardeshir, 1969	2,800	—		—			27.0
		• Cyrus, 1962	7,000	—		—			18.3
		• Darius, 1961	11,000	—		—			34.0
		• Fereidoon, 1966	7,000	—		—			28.5
		• Sassan, 1965	7,500- 8,100	—		—			34.0
		Total Iran		**361**		**257**	**2,164,000**	**33,115,561,734**	
IRAQ[e]		Ain Zalah, 1939	5,200- 6,500	NA	NA	NA	1,152,000	16,762,560,000	31.0
		Bai Hassan, 1953	4,800- 5,400						34.0
		Butmah, 1953	3,900						30.0
		Hamrin, 1973	2,000						—
		Jambur, 1954	5,500-12,500						38.0
		Kirkuk, 1927	2,800- 4,200						36.0
		Naft Khaneh, 1909	3,500						42.5
		Rumaila North, 1958	10,000						34.0
		Rumaila, 1953	10,800						35.0
		Zubair, 1949	11,000						34.2
		Abu Ghurab	—						27.7
		Buzurgan	—						27.7
		Jabal Fauqui	—						—
		Lahis	—						—
		Total Iraq		**NA**	**NA**	**NA**	**1,152,000**	**16,762,560,000**	
ISRAEL	LAPIDOTH	Heletz-Brur, 1955	5,200	—	4	3	93	12,162,400	28.0
		Kochav, 1962	5,500	—	3	1	42	4,045,800	27.0
		Ashdod, 1976	8,409	—	2	—	—	88,600	34.0
		Zuk Tamrur, 1982	6,107	—	1	—	*	6,500	27.0
		Total Israel		—	**10**	**4**	**135**	**16,303,300**	
ITALY	AGIP	Cavone, 1979	10,663-18,068	3	2	6	2,750	3,618,315	24.0
		Malossa, 1973	17,881-21,231	5	—	4	4,040	21,487,698	55.0
		Pisticci-S. Cataldo, 1960	6,820- 6,880	8	—	2	710	6,099,444	11.4
		• Gela, 1956	11,280-11,350	31	12	10	7,160	88,736,615	6.6-10.0
		• Perla	7,850	—	—	4	1,250	538,718	13.3
		• Cela Mare	10,300	6	2	6	1,180	12,331,733	10.0
		Other	—	16	5	26	245	19,661,072	2.8-55.9
	AGIP/SOMICEM	Ragusa, 1954	5,690- 5,860	—	31	14	4,520	120,860,743	19.5
	AGIP/SHELL	• Nilde, 1977	6,068	1	—	1	8,180	6,085,711	39.0
	ELF	• Santa Maria a Mare, 1974	7,900	8	1	—	6,000	15,379,000	23.0
		• Rospo Mare, 1975	4,600	3	—	4			11.0
		• Sarago Mare, 1979	5,200	2	—	2			8.0
		Total Italy		**83**	**53**	**79**	**36,035**	**294,798,779**	
IVORY COAST	ESSO COTE D'IVOIRE	• Belier, 1975	6,500	11	3	—	6,500	10,300,000	33.0
	PHILLIPS	• Espoir, 1980	6,500-11,000	5	—	2	15,414	10,067,248	33.0
		Total Ivory Coast		**16**	**3**	**2**	**21,914**	**20,367,248**	
JAPAN	JAPEX	• Aga-Oki, 1972	7,590	9	—	4	856	4,046,451	24.8
		Higashi-Niigata, 1965	4,500- 9,200	20	—	7	1,416	7,276,807	53.9
		Sarukawa, 1958	2,000- 3,200	9	18	44	560	9,790,391	32.3
		Yoshii, 1968	8,000	11	—	14	1,034	7,681,128	61.8
		Other	—	98	1	91	1,074	26,930,540	—
	TEIKOKU OIL	Kubiki, 1959	1,100- 6,400	20	70	39	494	12,136,307	29.7
		Minami-Aga, 1964	7,300- 9,600	10	2	14	506	12,996,520	38.5
		Yabase, 1933	1,100- 5,800	—	54	18	342	32,604,119	33.0
		Other	—	6	20	6	87	2,406,567	—
		Total Japan		**183**	**165**	**237**	**6,369**	**115,868,830**	
KUWAIT[e]	KOC	Ahmadi, 1953	4,800	530	...	514	983,000	21,311,565,000	32.9
		Bahra, 1956	8,500						—
		Burgan, 1938	4,800						32.0
		Magwa, 1951	4,800						33.6
		Minagish, 1959	10,000						34.2
		Raudhatain, 1955	8,600						34.7
		Sabriya, 1956	8,300						31.5
		Umm Gudair, 1963	9,000						26.7
		Total Kuwait		**530**	**...**	**514**	**983,000**	**21,311,565,000**	
LIBYA	AGIP	Bu Attifel, 1968	14,300	30	—	1	161,330	589,948,000	41.0
		Rimal-Katil, 1965	14,000	5	...	1	2,500	449,000	35.0
	ELF	Majid,* 1968	9,000- 9,800	10	...	5	...	...	40.0
		Don Mansour Unit*	5,600						32.0
		El Meheiriga	10,500						46.0
	LNOC[e]	Arshad, 1966	10,100						42.0
		Jebel, 1962	8,100						39.0

*Zuk Tamrur 1 was shut in October 1983 and returned to production on the pump in September 1984.

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
	Nasser, 1959	5,500- 7,600	NA	NA	NA	481,070	6,748,856,800	38.0
	Lehib-Dor Marada Unit, 1965	9,500						50.0
	Raguba, 1961	5,400						43.0
	Beda, 1959	4,000						36.0
	Bualawn, 1972	6,000						40.0
	Dor, 1967	6,400						33.2
	Kotla, 1963	5,500						34.0
	Sahabi B & D, 1961	9,000-10,000						39.0
	Sarir, 1961	9,000						37.2
	Amal, 1959	9,900						37.5
	Ora, 1962	7,250						40.2
	Ghani, 1978	6,000						40.0
	Other	—						—
OASIS GROUP[e]	Bahi, 1968	3,600- 3,750	—	491	—	336,770	4,734,584,300	43.4
	Belhedan, 1962	7,000						33.6
	Dahra, 1959	3,100- 3,700						37.0-41.0
	Defa, 1969	5,400- 5,900						35.6
	Gialo, 1961	2,200- 6,300						35.7
	Harash, 1978	7,400						34.6
	Khalifa, 1978	5,400- 7,000						34.6
	Masrab, 1978	10,000						39.6
	Samah, 1961	9,000						33.4
	Waha, 1960	6,600						36.0
	Zaggut, 1962	6,000						36.4
	Balat, 1983	5,100- 5,400						32.2
OCCIDENTAL	Ali, 1975	3,900	—	1	—	450	4,817,437	50.0
	Almas, 1975	4,000	—	6	1	1,350	16,172,939	49.5
	Intisar A, 1967	9,750	8	—	12	21,100	687,292,225	45.0
	Intisar B, 1974	9,600	2	—	—	790	5,632,051	50.0
	Intisar C, 1967	9,650	1	—	5	1,060	85,893,842	37.5
	Intisar D, 1967	9,400	18	4	5	58,900	966,348,052	39.0
	Intisar E, 1968	5,300- 7,100	7	—	4	2,820	14,115,453	34.7
	Nafoora-Augila, 1966	2,200-10,000	20	—	35	41,480	788,023,000	35.5
	Aswad, 1978	6,250	7	—	1	4,770	12,073,446	46.0
	Sabah, 1977	5,500	—	33	4	32,700	62,482,194	42.0
	Zella, 1977	6,750	—	30	1	13,100	46,224,910	48.1
	Other	7,900- 8,900	—	5	5	4,580	2,517,172	40.4
	Total Libya		**108**	**570**	**90**	**1,167,000**	**14,792,705,805**	
MALAYSIA **ESSO MALAYSIA**	● Bekok, 1976	5,500	23	—	7	33,000	53,000,000	47.0
	● Pulai, 1973	4,300	19	4	9	22,000	98,600,000	42.3
	● Tapis, 1975	6,700	70	—	36	74,000	134,500,000	45.0
	● Tembungo, 1971	6,000	10	1	4	8,000	22,800,000	38.0
	● Kepong, 1979	6,000	3	—	7	5,000	2,500,000	47.0
	● Tiong, 1978	5,800	28	—	14	50,000	19,000,000	47.0
	● Tinggi, 1980	4,400	26	—	5	28,000	13,800,000	48.0
	Irong Barat, 1979	3,300	10	—	2	20,000	2,800,000	35.0
	Semangkok, 1980	3,700	5	—	—	6,000	700,000	42.5
SARAWAK SHELL BERHAD	● Bakau, 1971	11,000	1	1	3	200	6,700,000	39.0
	● Baram, 1963	9,500	9	7	34	20,000	119,800,000	40.5
	● Baronia, 1967	7,900	19	—	27	28,000	124,700,000	42.0
	● Betty, 1967	7,900	8	—	5	21,000	40,000,000	38.0
	● Fairley-Baram, 1963	8,655	—	—	—	—	18,200,000	—
	● West Lutong, 1966	5,600	8	5	15	10,500	111,200,000	39.5
	Miri, 1911	—	—	—	—	—	79,727,300	27.0
	● Temana, 1972	3,100	6	8	21	20,000	21,000,000	35.0
	● Tukau, 1966	5,000	5	13	34	21,000	63,000,000	29.2
	● Bokor, 1972	2,900	7	2	2	18,000	5,200,000	35.0
	● Bayan, 1976	4,200	7	—	—	700	—	37.3
SABAH SHELL	● Samarang, 1972	5,700	30	9	22	43,200	172,900,000	37.0
	● South Furious, 1974	3,300	5	—	9	2,900	7,500,000	30.0
	● Erb West, 1972	6,875	12	—	1	18,000	9,800,000	30.0
	● St. Joseph, 1975	2,200	4	—	3	8,700	4,900,000	32.0
	● Barton, 1971	2,400	3	—	1	3,400	4,100,000	37.0
	Total Malaysia		**318**	**50**	**261**	**461,800**	**1,098,427,300**	
MEXICO **PEMEX** **NORTH ZONE, NE**	All fields	—	229	43	10	1,632	17,261,556	...
NORTH ZONE, N.	● Arenque, 1970	11,362	18	...	9	6,941	69,030,674	26.0
	Constituciones, 1956	6,350	43	86	77	7,567	71,428,473	17.0
	Ebano-Panuco, 1901	1,450	67	117	104	4,875	939,510,515	12.0
	Tamaulipas	4,200	54	79	108	7,089	69,096,310	19.0
	Other	—	12	—	40	440	9,676,379	—
NORTH ZONE, S.	Chicontepec, 1973	4,264	4	...	31	4,409	9,267,422	34.1
	● Isla de Lobos, 1963	6,875	2	...	...	566	20,765,309	40.0
	● Marsopa, 1974	10,198	7	...	3	1,371	13,151,918	39.0
	Naranjos-C. Azul, 1909	1,800	198	...	31	8,120	1,206,650,151	22.0
	Tres Hermanos, 1959	6,960	40	...	82	3,164	104,106,972	21.0
	Other	...	...	...	6	748	18,908,733	—

*Elf is no longer partner in oil production

PRODUCTION BY FIELDS

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	No. of wells Artificial lift	No. of wells Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
CENTRAL ZONE, POZA RICA	• Atun, 1966	9,040	...	...	7	1,497	35,512,252	37.0
	• Bagre, 1973	10,919	...	...	5	4,617	38,661,837	33.0
	Escolin, 1942	7,216	...	97	90	14,454	207,550,853	26.3
	Hallazgo, 1955	10,170	...	37	42	4,831	72,779,841	25.0
	Jiliapa, 1958	7,390	...	34	61	956	27,661,571	24.0
	Mecatepec, 1941	7,544	...	42	34	2,698	134,759,161	29.8
	Miquetla, 1959	6,480	1	71	31	1,207	24,789,695	35.0
	Poza Rica, 1930	7,090	...	123	126	17,637	872,112,199	35.0
	Pres. Alemán, 1949	8,036	59	54	87	2,679	31,156,597	26.0
	Remolino, 1952	10,745	...	39	49	1,145	20,811,647	29.5
	San Andrés, 1956	10,410	9	104	144	16,498	334,462,523	29.0
	Other	...	87	134	99	5,948	88,652,445	...
CENTRAL ZONE, N. FAJA DE ORO	Acuatempa, 1955	4,085	9	...	15	314	25,748,128	21.0
	Muro, 1965	3,966	11	...	6	640	19,293,776	17.0
	Ordóñez, 1952	5,220	11	...	10	975	57,183,057	21.0
	Ocotepec, 1953	3,737	15	...	4	396	19,557,598	20.0
	Santa Agueda, 1953	4,760	13	...	45	1,570	102,117,074	16.0
	Other	...	65	...	42	1,294	55,084,143	...
CENTRAL ZONE, CUENCA DEL PAPALOAPAN	Mataproche, 1974	11,129	31	...	22	5,598	21,557,717	35.6
	Other	...	23	...	49	5,439	57,841,081	...
SOUTHERN ZONE, AGUA DULCE	Blasillo, 1967	7,216	16	18	26	6,265	22,524,616	40.0
	Cinco Presidentes, 1960	6,862	14	60	57	9,158	243,438,140	35.0
	Burro, 1931	2,200	1	5	12	1,207	21,518,316	26.0
	Venta, 1954	4,730	3	...	59	1,623	58,034,861	41.0
	Ogarrio, 1957	5,790	13	53	112	7,812	131,936,253	38.0
	Otates, 1965	7,469	3	11	4	2,138	24,389,292	39.0
	Rodador, 1971	11,398	5	14	7	2,314	7,223,102	26.0
	Sánchez Magallanes, 1957	4,240	5	82	248	7,441	130,243,338	27.0
	San Ramón, 1967	9,517	4	26	35	5,522	55,352,082	30.0
	Tonalá, 1928	1,770	1	18	29	1,138	77,008,432	28.0
	Other	...	1	...	3	559	1,026,018	...
SOUTHERN ZONE, COMALCALCO	Agave, 1977	13,450	...	...	16	15,027	82,635,655	41.7
	Arroyo Zanapa, 1978	14,599	1	...	1	1,667	7,955,101	38.9
	Arteza, 1977	11,800	2	...	4	2,818	28,025,824	26.4
	Ayapa, 1972	8,200	2	...	3	503	5,096,422	7.2
	Cacho Lopez, 1977	14,250	1	...	...	69	2,302,178	39.0
	Cactus, 1972	14,100	13	...	20	16,832	258,868,101	31.5
	Carrizo, 1962	3,500	4	10	2	692	10,003,597	23.3
	Castarrical, 1967	10,080	1	...	36	1,730	36,699,665	29.3
	Comoapa, 1979	14,432	3	...	4	5,963	12,775,040	44.5
	Copano, 1977	11,890	8	...	1	10,580	11,375,081	43.9
	Cunduacán, 1974	13,775	7	...	20	25,864	368,340,167	28.9
	El Golpe, 1963	3,570	...	50	32	4,000	73,062,879	25.7
	Giraldas, 1977	15,125	21	...	3	46,495	89,435,635	37.0
	Iride, 1974	13,775	12	...	5	40,161	130,621,172	28.5
	Mecoacán, 1957	2,200	8	10	15	755	36,358,974	8.6
	Mundo Nuevo, 1977	11,800	1	...	5	3,944	21,294,436	46.0
	Nispero, 1974	14,100	3	...	10	14,089	103,163,252	34.4
	Ojacaque, 1977	11,150	1	...	20	2,679	92,502,941	29.1
	Paredón, 1978	15,690	10	...	2	48,634	70,422,186	39.8
	Platanal, 1978	15,900	...	...	...		2,967,641	30.2
	Rio Nuevo, 1975	14,950	6	...	2	11,454	53,711,002	34.8
	Samaria (Cret), 1973	14,209	28	1	31	729	874,730,826	31.0
	Santuario, 1966	9,617	4	9	10	3,151	30,799,654	37.0
	Sitio Grande, 1972	13,766	13	...	11	36,425	254,015,775	35.0
	Sunuapa, 1978	12,887	3	...	6	1,799	22,162,664	32.8
	Tintal, 1968	5,904	5	...	7	604	4,169,037	22.0
	Topen, 1978	11,172	2	...	1	1,748	1,931,319	25.4
	Tupilco, 1959	9,685	6	23	33	3,856	46,087,421	27.0
	Bellota, 1982	17,056	6	...	...	14,920	6,609,532	41.0
	Cardenas, 1979	17,548	26	...	8	138,462	94,765,498	38.0
	Chiapas, 1979	12,136	7	...	...	11,184	20,392,463	42.0
	Fenix, 1979	17,876	3	...	4	7,069	18,767,573	40.0
	Iris, 1979	14,432	7	...	1	4,296	8,942,053	39.2
	Jujo, 1980	17,548	16	...	2	95,633	47,603,405	32.0
	Muspac, 1982	9,676	2	...	11	1,270	828,638	57.0
	Tapijulapa, 1982	15,613	...	...	10	113	83,625	39.8
	Mora, 1981	...	8	...	2	26,424	8,693,950	38.1
	Caparroso, 1982	18,368	1	...	...	245	154,602	41.2
	Tecominoacan, 1983	19,519	1	...	...	7,875	3,993,634	37.5
	Jolote, 1983	18,119	1	...	...	1,201	732,156	39.4
	Artesa Terc., 1984	...	...	...	...	654	119,504	28.0
	Carrizo, 1980	10,050	1	...	...	1,069	935,776	45.6
	Eden, 1983	17,590	1	...	...	8,359	1,520,997	38.5
	Samaria Terc., 1965	4,920	4	5	14	130,071	5,494,170	13.9
SOUTHERN ZONE, EL PLAN	Agata, 1956	3,830	2	10	4	459	11,510,863	...
	Bacal, 1976	3,500	24	5	23	19,039	74,095,118	35.0
	Concepción, 1974	1,600	3	4	8	711	3,932,212	31.0
	Cuichapa, 1935	2,200	16	52	54	9,510	118,620,292	30.0
	El Plan, 1931	1,700	...	32	10	3,032	151,834,278	30.0
	Lacamango, 1973	1,700	10	9	8	1,874	9,538,728	26.3
	Los Soldados, 1953	4,492	2	15	4	1,132	23,404,071	32.0
	Other	...	2	6	7	470	33,091,676	...
SOUTHERN ZONE, NANCHITAL	Ixhuatlán Ote., 1965	1,960	1	1	8	1,264	9,418,426	22.6
	Moloacán, 1962	900	1	128	37	2,616	19,737,334	22.3
	Santa Rosa, 1952	1,312	...	8	2	726	5,120,852	25.4

	WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
				Flow	Artificial lift	Shut-in			
	GULF OF CAMPECHE	● Cantarell, 1976	8,528	58	...	6	1,004,412	1,468,711,364	21.3
		● Abkatun, 1978	11,800	27	...	2	408,781	402,766,525	30.0
		● Ku, 1979	10,000	8	...	2	198,783	166,662,456	22.0
		● Pol, 1979	12,600	5	...	1	122,881	104,489,411	35.0
		● Chuc, 1982	13,100	1	...	1	28,298	18,076,617	35.0
		● Ixtoc, 1984	...	1	...	...	1,138	207,563	...
		Total México		**1,484**	**1,725**	**2,695**	**2,737,847**	**11,141,211,085**	
MOROCCO(e)		Haricha, 1957	3,000	...	...	...	180	3,183,000	40.0
		Other	...	...	...	...	...	12,554,000	
		Total Morocco		...	...	...	**180**	**15,737,000**	
NETHERLANDS	UNION	● Helm, 1979	4,400	2	4	...	3,887	2,882,045	18.3
		● Helder, 1980	4,800	1	11	...	12,958	6,000,692	21.7
		● Hoorn, 1981	5,000	...	6	...	14,763	5,525,857	26.0
	SHELL	DeLier-Munster, 1955	5,200	28		6	756	16,000,000	33.2
		Berkel, 1954	NA	8		...	2,095	1,700,000	32.1
		Ysselm-Ridderkerk, 1956	5,200	84		...	5,167	83,200,000	18.0
		Pijnacker, 1955	NA	6		1	55	5,500,000	36.3
		Wassenaar, 1956	4,200	35		3	1,985	44,000,000	18.6
		Zoetermeer, 1957	3,200	23		3	658	9,100,000	16.4
		Schoonebeek, 1943	2,500	395		14	15,737	217,400,000	24.8
		Other	...	30		25	100	4,600,000	...
		Total Netherlands		**633**		**52**	**58,161**	**395,908,594**	
NEW ZEALAND	SHELL-BP-TODD	● Kapuni,(c) 1959	10,318-11,775	10	...	1	6,845	31,520,000	54.0
	MAUI DEVELOPMENT LTD.	● Maui,(c) 1969	8,615-11,068	9	...	5	9,840	11,670,000	58.0
	PCNZ	McKee, 1981 Pouri, 1983	7,848	4	...	2	1,500	207,382	36.0
		Kaimiro,(c) 1982	11,856-11,900	1	...	...	...	4,014	...
		Tuhua, 1983	...	2	...	...	...	26,298	42.0
		Pukemai, 1983	...	1	...	1	...	21,856	42.0
		Total New Zealand		**27**	...	**9**	**18,185**	**43,449,550**	
NIGERIA	AGIP-PHILLIPS	Akri, 1977	9,600-10,600	6	...	5	8,507	49,116,065	39.9
		Akri West, 1975	9,900-10,200	...	...	2	...	482,258	31.4
		Ashaka, 1968	9,700-12,000	1	...	...	389	1,573,780	41.0
		Beniku, 1974	12,000	1	...	1	909	2,631,915	44.3
		Ebegoro, 1976	11,500-12,000	6	...	3	9,268	48,301,932	35.7
		Ebocha, 1965	8,000-10,900	10	...	6	9,625	97,330,007	38.5
		Idu, 1973	7,750-10,700	...	...	10	...	23,862,581	28.0
		Kwale, 1968	10,000-11,500	2	...	2	1,295	1,665,170	44.3
		M'Bede, 1966	7,300- 9,400	8	...	6	14,502	138,897,327	41.1
		Obama, 1975	11,600-14,300	7	...	1	17,840	70,096,858	38.2
		Obiafu, 1973	9,300-12,200	3	...	14	10,159	64,447,068	41.3
		Obrikom, 1973	8,000-10,000	2	...	10	6,018	45,835,527	41.5
		Odugri, 1972	12,500	2	...	...	1,624	8,491,833	44.8
		Ogbogene, 1976	10,000-12,000	...	...	2	...	3,279,728	37.0
		Ogbogene W., 1981	13,000	...	...	1	262	289,556	56.2
		Okpai, 1968	10,000-12,000	8	...	...	4,380	11,397,334	42.3
		Omoku West, 1975	11,500	...	...	1	912	3,914,818	35.0
		Oshi, 1974	9,600-11,300	9	...	2	6,704	49,804,085	39.5
		Tebidaba, 1975	10,300-13,300	6	...	4	18,775	88,072,880	35.5
		Umuoru, 1975	14,100	...	...	4	1,531	1,629,545	43.0
		Agwe, 1977	10,800	1	...	...	625	1,092,948	55.0
		Clough Creek, 1977	10,000-12,400	8	...	...	8,508	8,228,940	43.0
	PHILLIPS	Gilli-Gilli, 1967	7,600-14,000	2	...	1	1,102	1,996,717	47.4
	ASHLAND	Izombe-Ossu, 1974	9,500	17	...	3	13,100	35,248,000	43.0
		● Akam,* 1980	7,000	7	...	2	12,500	1,892,000	36.0
	ELF	Aghigo, 1972	6,000- 8,500	1	15	1	5,022	16,875,442	25.7
		Okpoko, 1967	6,000- 7,500	9	8	2	8,758	18,571,609	23.0
		Obodo-Jatumi, 1966	6,000-11,000	12	6	5	13,544	45,590,484	31.1
		Upomami, 1965	6,000- 7,000	...	13	1	2,770	11,698,167	19.8
		Obagi, 1964	6,000-10,000	46	7	24	66,642	280,457,150	24.0
		Erema, 1972	9,800	1	...	...	2,217	4,815,900	35.4
	GULF	Abiteye, 1970	5,750- 9,400	12	...	7	10,541	49,108,550	37.8
		● Delta, 1965	5,600- 9,500	23	...	4	11,356	141,743,712	34.0
		● Delta South, 1965	7,100-10,179	17	...	10	18,315	225,770,946	38.6
		● Isan, 1970	5,900- 9,000	6	...	5	3,501	38,937,007	39.4
		Makaraba	7,100-12,005	21	...	5	17,826	57,052,810	31.5
		● Malu, 1969	4,800- 6,300	12	...	6	12,810	76,315,178	40.0
		● Mefa, 1965	8,570-12,030	5	...	...	3,424	11,153,089	37.1
		● Meji, 1965	5,200-10,900	19	...	3	13,015	123,883,677	32.9
		● Meren, 1965	5,000- 7,500	25	...	25	29,814	403,953,946	31.3
		● Okan, 1964	5,500- 9,245	50	...	17	30,281	381,194,687	36.0
		● Parabe/Eko, 1968	4,500- 8,200	12	...	13	5,710	90,315,521	36.7
		Utonana, 1971	7,400- 9,165	2	...	3	1,320	6,882,333	35.6
		● W. Isan, 1971	7,825-10,229	6	...	3	3,798	30,278,289	38.1
		Yorla South, 1974	11,389-12,635	...	...	2	...	834,040	...

PRODUCTION BY FIELDS

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
			Flow	Artificial lift	Shut-in			
	Jisike, 1975	6,300- 7,600	3	...	1	1,454	3,410,983	44.0
	Robertkiri, 1964	11,484-13,190	11	...	...	...	1,690,745	...
	• Tapa, 1978	8,150-10,842	10	...	...	9,701	11,474,592	36.0
MOBIL	• Adua, 1967	6,970	6	...	6	8,017	33,061,550	30.3
	• Asabo, 1966	5,600	9	...	11	15,082	137,296,089	32.4
	• Ekpe, 1966	8,200	6	...	10	16,273	167,820,498	30.3
	• Ekpe-WW, 1977	6,810	6	...	3	8,410	20,712,452	30.3
	• Eku, 1966	5,420	3	...	6	2,482	13,268,716	30.8
	• Enang, 1968	6,600	18	...	3	22,302	93,392,885	35.1
	• Etim, 1968	6,200	6	...	1	11,056	83,979,749	32.9
	• Idoho, 1966	9,020	2	...	8	1,621	26,508,571	30.8
	• Inim, 1966	5,850	7	...	2	17,028	116,519,332	37.8
	• Mfem, 1967	5,200	3	...	...	5,114	18,604,225	36.1
	• Ubit, 1968	5,400	27	...	16	32,573	144,381,295	36.1
	• Unam, 1968	5,180	6	...	2	8,462	32,820,069	33.5
	• Utue, 1966	5,700	6	...	...	6,870	57,312,173	36.8
	• Isobo, 1968	4,345	3	...	2	4,071	4,642,809	30.8
	• Iyak	NA	7	...	1	16,430	5,951,767	38.7
INPEX	Ogharefe, 1973	9,900	9	...	3	4,799	6,322,431	47.4
SHELL (MIDWEST)	Ugh-Ogini, 1964	5,860	6	...	...	2,022	17,835,995	19.0
	Ugh-Uzere-East, 1960	8,500	11	...	...	7,223	80,022,750	23.0
	Ugh-Uzere-West, 1964	8,500	10	...	...	6,672	93,295,124	23.0
	Ugh-Olomoro, 1963	7,000-10,000	17	...	...	25,899	251,101,242	22.0
	Ugh-Oweh, 1964	12,300	8	...	...	5,378	88,439,495	28.0
	Ugh-Kokori, 1960	8,000 9,800	12	...	...	16,465	289,936,980	42.0
	Ugh-Afiesere, 1966	8,000- 9,000	27	...	...	14,856	100,469,000	22.0
	Ugh-Eriemu, 1961	12,500	10	...	...	4,435	34,972,640	26.0
	Ugh-Ughelli-East, 1959	11,800	6	...	...	4,102	84,846,524	35.0
	Ugh-Ughelli-West, 1963	7,400-10,200	6	...	...	3,366	28,554,485	21.0
	Ugh-Utorogu, 1964	9,000	13	...	...	9,522	120,276,326	25.0
	Ugh-Oroni, 1964	12,000	4	...	...	2,335	24,326,150	22.0
	Ugh-Warri-River, 1961	12,264	2	...	...	1,879	13,520,573	31.0
	Ugh-Evwreni, 1968	10,900	4	...	...	1,010	32,491,733	28.0
	Ugh-Isoko, 1960	NA	1	...	...	748	4,954,683	19.0
	Forc-Odidi, 1967	10,980	16	...	...	23,145	178,218,417	37.0
	Forc-Opukushi, 1963	7,823	9	...	...	35,142	83,850,080	29.0
	Forc-Jones Creek, 1967	7,000- 9,000	14	...	...	25,644	352,778,244	29.0
	Forc-Opuama, 1973	NA	4	...	...	5,574	20,610,750	41.0
	Forc-Egwa, 1967	9,350	10	...	...	13,861	117,669,004	37.0
	Forc-Forcados/Yokri, 1968	10,859	36	...	...	52,628	450,755,336	22.0
	Forc-Batan, 1968	11,000	7	...	...	4,684	50,247,873	27.0
	Forc-Escravos Beach, 1969	9,931	7	...	...	9,568	48,309,125	36.0
	Forc-Otumara, 1969	8,176	14	...	...	26,482	122,398,038	25.0
	Forc-Saghara, 1970	8,590	5	...	...	6,628	26,056,830	31.0
	Forc-Ajuju, 1970	13,324	1	...	...	1,005	8,996,200	27.0
	Forc-Benisede, 1973	...	12	...	...	39,701	70,412,540	23.0
	Node-Sapele, 1970	12,788	10	...	...	7,082	90,263,834	42.0
	Node-Oben, 1972	12,036	12	...	...	23,088	80,269,530	40.0
	Forc-Opukushi N., 1977	NA	1	...	...	1,147	1,698,136	30.0
	Abura	...	3	...	...	4,861	11,676,464	44.8
	Rapele	...	2	...	...	576	20,453,993	44.4
SHELL (EAST)	Phl-Bomu, 1958	6,500- 7,500	14	...	...	11,457	337,957,710	36.0
	Phl-Imo River, 1959	5,800-10,000	28	...	...	34,246	418,373,768	32.0
	Phl-Nkali, 1963	12,000	4	...	...	...	27,155,077	42.0
	Phl-Elelenwa, 1959	11,000	...	...	...	...	...	39.0
	Phl-Umuechem, 1969	5,800-10,700	5	...	...	6,949	138,773,515	36.0
	Phl-Apara, 1960	9,000	4	...	...	1,820	19,950,511	36.0
	Phl-Bodo-West, 1959	9,700	5	...	...	5,307	71,086,732	29.0
	Phl-Afam, 1956	6,000	9	...	...	7,625	53,124,807	45.0
	Phl-Yorla, 1970	11,917	7	...	...	5,085	52,175,509	44.0
	Phs-Bonny, 1959	12,254	6	...	...	5,516	79,109,106	36.0
	Phs-Cawthorne Channel, 1963	11,000	9	...	...	24,918	215,032,161	38.0
	Phs-Ekulama, 1958	10,483	12	...	...	27,887	151,980,094	32.0
	Phs-Soku, 1958	11,500	12	...	...	8,788	94,908,237	31.0
	Phs-Orubiri, 1971	NA	...	...	...	...	...	38.0
	Egb-Oguta, 1965	10,300	12	...	...	13,662	116,619,855	46.0
	Eade-Utapate South, 1974	NA	5	...	...	6,652	26,668,348	44.0
	Eade-Opobo South, 1974	NA	3	...	...	4,425	7,865,972	44.0
	Cesw-Nun River, 1960	NA	2	...	...	1,059	26,270,987	39.0
	Cesw-Etelebou, 1971	12,000	6	...	...	17,699	103,149,496	33.0
	Cesw-Kolo Creek, 1960	12,000	13	...	...	25,344	96,265,181	42.0
	Cesw-Diebu Creek, 1966	NA	2	...	...	537	88,080,502	43.0
	Phl-Isimiri, 1964	5,900-11,000	2	...	...	2,449	34,454,360	28.8
	Phl-Onne, 1965	10,384	3	...	...	740	7,945,549	29.0
	Phl-Obigbo-North, 1963	6,500-10,000	24	...	...	14,844	150,627,800	22.0
	Phl-Ajokpori, 1967	NA	1	...	...	766	4,008,132	29.0
	Phl-Agbada, 1960	8,000-12,000	28	...	...	19,590	146,952,677	32.1
	Phl-Akuba, 1967	NA	1	...	...	435	3,660,689	29.0
	Cesw-Adibawa, 1967	11,950	12	...	...	15,575	54,925,219	26.0
	Cesw-Adibawa NE, 1973	NA	2	...	...	2,355	10,160,853	26.0
	Cesw-Ubie, 1961	14,380	3	...	...	4,703	24,129,180	28.0
	Phl-Obeakpu, 1975	NA	2	...	...	3,166	12,568,650	45.0
	Cosw-Nembe Creek, 1973	NA	17	...	...	53,673	115,383,563	35.0
	Phs-Akaso, 1979	NA	1	...	...	892	1,069,338	30.0

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
			Flow	Artificial lift	Shut-in			
TEXACO-CHEVRON	● Pennington, 1965	5,000-10,400	2	...	8	1,690	21,779,717	37.5
	● Middleton, 1972	5,000- 7,000	4	...	3	3,361	11,420,610	37.5
	● North Apoi, 1973	4,000- 8,100	21	...	3	36,959	109,697,447	36.5
	● Funiwa, 1978	5,000- 7,000	13	...	1	12,796	8,852,911	37.5
	● Sengana, 1967	...	2	...	...	993	180,672	38.5
*Began production Feb. 2, 1984	**Total Nigeria**		**1,128**	**49**	**306**	**1,371,635**	**9,596,705,396**	
NORWAY PHILLIPS	● Ekofisk, 1968	10,000	39	...	2	148,888	772,243,876	41.1
	● West Ekofisk, 1970	10,300	8	...	2	11,709	71,242,189	43.9
	● Cod, 1968	9,500	6	...	...	5,862	15,498,815	55.0
	● Tor, 1970	10,000	11	...	2	20,050	96,788,586	38.0
	● Albuskjell, 1972	10,400	16	...	2	12,782	41,210,775	45.0
	● Edda, 1972	10,480-10,600	7	...	...	61,545	19,539,375	41.5
	● Eldfisk, 1970	9,350-10,000	26	...	4	4,744	145,017,817	37.6
MOBIL GROUP	● Statfjord, 1974	7,700	25	...	...	*425,348	392,108,713	39.0
AMOCO	● Valhall, 1972	8,200	10	...	2	50,182	16,204,876	35.0
CONOCO	● Murchison, 1975	...	13	...	2	†27,354	†25,121,222	37.0
	Total Norway		**171**	**...**	**16**	**‡700,781**	**1,532,591,748**	
OMAN PDO	Al Huwaisah, 1969	5,500	1	33	3	22,910	142,110,000	37.0
	Fahud, 1963	2,000- 6,080	27	76	67	64,450	663,870,000	32.7
	Ghaba North, 1972	2,500- 6,100	1	8	5	5,520	37,320,000	35.8
	Habur, 1975	2,500- 5,800	1	...	1	280	3,940,000	14.8
	Lekhwair, 1974	7,500	5	14	25	8,160	37,240,000	37.8
	Natih, 1963	7,500	8	24	23	31,860	308,050,000	31.0
	Qarn Alam, 1972	1,370- 6,500	...	4	2	1,770	17,210,000	14.8
	Saih Nihaydah, 1972	8,700	...	11	2	19,560	112,470,000	39.0
	Saih Rawl, 1973	9,300	4	10	8	14,100	74,610,000	41.1
	Yibal-Shuaiba, 1963	8,465	17	91	5	114,760	429,480,000	40.2
	Marmul, 1977	3,400-11,200	...	129	2	44,690	53,160,000	22.0
	Qaharir, 1978	7,500	...	23	3	8,310	11,900,000	30.6
	Mahjour, 1979	11,700	3	...	2	1,450	1,060,000	37.2
	Birba, 1978	10,500	2	...	1	4,550	3,390,000	33.4
	Rahab, 1978	7,400	...	15	7	1,670	1,810,000	22.0
	Qata, 1979	6,200	...	12	1	1,410	1,040,000	26.2
	Rima, 1979	2,800	10	13	...	43,660	22,400,000	32.8
	Shibkah, 1976	2,400	1	...	1	710	260,000	28.7
	Zauliyah, 1981	7,600	5	...	1	4,400	530,000	45.2
ELF GROUP	Sahmah, 1978	12,400	1	3	...	9,860	15,030,000	45.0
OCCIDENTAL PETROLEUM	Safah, 1983	6,100	3	...	1	390	60,000	38.0
	Total Oman		**89**	**466**	**160**	**404,470**	**1,936,940,000**	
PAKISTAN UNION TEXAS	Khaskeli, 1981	3,500	7	...	3	3,635	2,931,233	39.0
	Laghari, 1983	2,600	3	...	1	1,834	350,415	42.0
	Tajedi, 1984	5,300	...	...	1	...	...	46.0
PAKISTAN PETROLEUM	Adhi, 1978	9,118- 9,190	3	...	...	568	609,051	...
OGDC	Toot, 1968	14,900	11	...	...	2,600	6,877,534	...
	Fimkassar, 1982	11,465	1	...	...	20	2,366	...
PAKISTAN OILFIELDS LTD.	Balkassar, 1946	8,398	...	4	...	525	30,969,917	...
	Dhulian, 1936	8,899	...	...	...	22	41,275,829	...
	Joya Mair, 1944	6,900	...	1	2	250	5,401,052	...
	Meyal, 1968	13,521	6	...	4	5,528	25,258,408	...
	Khaur, 1915	9,306	...	1	...	7	4,155,695	...
OCCIDENTAL PAKISTAN	Dhurnal-1, 1984	13,125	1	...	...	1,565	50,094	...
	Total Pakistan		**32**	**6**	**11**	**16,554**	**117,881,594**	
PERU BELCO	● Peña Negra, 1960	3,000- 8,500	36	143	54	12,573	88,965,213	38.0
	● Lobitos, 1960	3,500- 7,500	17	115	76	9,226	37,558,038	38.0
	● Litoral, 1955	1,500- 6,000	8	90	39	3,780	32,174,949	36.0-40.0
	● Providencia, 1967	3,000- 7,000	1	46	27	1,290	18,991,908	38.0-40.0
OCCIDENTAL	Barta, 1979	8,000- 8,930	...	14	2	7,900	7,948,689	11.5
	Capahuari Sur, 1973	11,800-12,900	...	16	9	17,560	110,903,581	35.6
	Dorissa, 1978	9,800-10,600	...	11	1	10,000	21,126,588	34.0
	Forestal, 1973	9,000- 9,900	...	7	3	7,690	24,296,504	26.7
	Huayuri Sur, 1977	10,000-10,800	...	9	3	4,110	11,433,903	29.3
	San Jacinto, 1978	7,200- 7,950	1	3	...	2,000	741,462	13.1
	Shiviyacu, 1973	9,100-10,100	...	15	3	16,070	26,297,260	20.8
	Jibaro, 1974	10,110-11,155	...	5	1	3,570	1,765,022	11.3
	San Jacinto, 1978	8,783- 9,760	1	14	3	9,430	13,194,350	23.5
OCCIDENTAL/BRIDAS	Talara area*	1,343- 6,080	...	1,831	...	36,260	139,785,079	36.0
PETROPERU	Talara-Lima area, 1869-1905	2,000- 9,000	121	1,484	3,962	21,358	906,282,890	33.4
	Corrientes, 1971	10,000-12,600	15	15	5	26,397	51,125,454	29.8
	Pavayacu, 1972	9,600-11,300	...	11	4	4,739	10,539,820	30.2
	Nueva Esperanza, 1980	10,200-10,700	2	1	2	2,554	2,489,175	44.0
	Yanayacu, 1974	11,400-13,600	...	7	3	1,220	1,933,106	19.1

*Norway's 84.09% share of production from unitized field only. †Norway's 25.0623% share of production from unitized field only. ‡Includes about 58,500 b/d of NGL.

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
	Capirona, 1972	9,800-12,000	...	4	2	1,376	2,019,529	25.3
	Valencia, 1975	10,550-11,200	...	1	2	690	459,997	44.0
	Maquia, 1957	2,100- 2,400	8	18	2	599	10,386,906	37.5
	Other	...	...	13	18	175	14,073,509	...
*Secondary recovery project.	**Total Peru**		**210**	**3,873**	**4,221**	**200,567**	**1,544,492,932**	
PHILIPPINES OCCIDENTAL	● South Nido, 1977	6,660- 6,945	3	..	2	1,200	14,258,096	27.0
	● Matinloc, 1979	6,800	5	..	...	5,000	4,432,824	42.9
AMOCO	● Cadlao, 1977	5,800	2	..	...	5,308	5,435,000	48.0
	Total Philippines		**10**	**...**	**2**	**11,508**	**24,125,920**	
QATAR QGPC	● Bul Hanine, 1970	6,000	14	...	1	121,284	568,134,637	35.0
	Dukhan, 1940	6,500	116	...	45	213,600	2,216,500,000	41.1
	● Idd El Shargi, 1960	4,500- 8,250	25	...	6	15,036	184,721,699	35.0
	● Maydan-Mahzam, 1963	7,000	19	...	5	65,806	673,668,152	38.0
	Total Qatar		**174**	**...**	**57**	**415,726**	**3,643,024,488**	
RAS al KHAIMAH GULF	● Saleh	14,500	2	...	...	5,832	1,061,337	44.2
	Total Ras al Khaimah		**2**	**...**	**...**	**5,832**	**1,061,337**	
SAUDI ARABIA(e) ARAMCO	Abqaiq, 1940	6,690	NA	NA	NA	4,951,000	49,118,275,000	37.0
	Abu-Hadriya, 1940	9,340						35.0
	● Abu-Safah, 1963	6,600						30.0
	● Berri, 1964	8,300						32.0-34.0
	Dammam, 1938	4,800						35.0
	Fadhili, 1949	8,050						39.0
	Ghawar, 1948	6,920						34.0
	Harmaliyah, 1971	8,430						35.0
	Khurais, 1957	5,200						33.0
	Khursaniyah, 1956	6,560						31.0
	● Manifa, 1957	7,950						29.0
	● Marjan, 1967	6,800						33.0
	● Qatif, 1945	7,100						33.0-34.0
	● Safaniyah, 1951	5,100						27.0
	● Zuluf, 1965	5,800						32.0
	Total Saudi Arabia		**NA**	**NA**	**NA**	**4,951,000**	**49,118,275,000**	
SHARJAH CRESCENT	● Mubarek, 1972	12,650-12,990	1	3	..	5,904	71,595,228	37.0
AMOCO	Saaja,(c) 1980	10,200	14	...	1	56,454	25,141,059	50.0
	Total Sharjah		**15**	**3**	**1**	**62,358**	**96,736,287**	
SPAIN SHELL ESPANA	● Amposta Marino North, 1970	10,000	1	1	...	1,435	54,000,000	37.0
CHEVRON	● Casablanca, 1975	8,000	6	...	...	38,356	42,000,000	34.0
AMOSPAIN	Ayoluengo, 1964	4,000	...	31	2	1,530	12,570,000	37.0
SHELL/CAMPSA	● Castellon B, 1972	9,000	1	..	...	7,098	12,200,000	35.0
ENIEPSA	● Dorada, 1975	6,700	2	...	...	5,795	14,318,656	21.0
	● Salmonete, 1984	12,600	...	...	1	...	...	44.0
	● Angula, 1984	12,000	...	...	1	...	...	33.0
	Total Spain		**10**	**32**	**4**	**54,214**	**135,088,656**	
SURINAME STAATSOLIE	Tambaredjo	984	...	12	...	467	217,000	15.8
	Total Suriname		**...**	**12**	**...**	**467**	**217,000**	
SYRIA S.P.C.	Alian, 1974	5,600	4	8	...	1,160	5,148,127	19.0
	Gbebeh, 1976	2,000	11	13	...	2,726	2,778,032	18.0
	Jebisseh, 1968	2,000	21	101	...	7,570	20,229,899	18.0
	Karachok, 1968	6,000	3	81	...	24,800	119,015,821	20.0
	Rumilan, 1962	5,600	8	39	...	6,400	39,439,804	24.0
	Soudie, 1959	5,500	4	428	...	107,700	598,493,034	24.0
	Tichrin,1976	2,700	4	14	...	2,495	2,563,107	18.0
	Other	...	7	56	..	8,540	12,531,868	...
	Total Syria		**62**	**740**	**...**	**161,391**	**800,199,692**	
THAILAND UNION OIL	Erawan,(c) 1973	7,000	59	...	12	5,891	5,774,162	56.0
	Baanpot,(c) 1980	7,000	10	...	...	1,587	341,572	56.0
THAI SHELL	Sirikit, 1981	5,258- 5,976	15	...	...	10,962	4,205,639	41.0
	Total Thailand		**84**	**...**	**12**	**18,440**	**10,321,373**	

WORLDWIDE PRODUCTION		Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
				Flow	Artificial lift	Shut-in			
TRINIDAD	**AMOCO**	● Teak, 1971	15,191	19	33	...	38,380	177,369,112	29.3
		● Samaan, 1971	11,780	10	32	...	23,819	154,299,995	36.8
		● Poui, 1974	11,650	9	21	...	16,180	119,061,818	34.0
		● Cassia, 1973	12,700	3	...	...	4,900	1,515,875	45.0
	T.N.A.	● Soldado,* 1955	11,000	61	237	...	37,933	414,470,719	24.8
		Fortin Offshore (FOS), 1954	...	4	11	...	441	6,608,208	...
	TRINIDAD-TESORO	Palo Seco/Erin/McKenzie, 1926	12,718	41	445	...	7,923	106,018,969	20.2
		Fyzabad/Apex/Quarry, 1920-38	11,000	7	325	...	4,182	165,434,036	21.5
		Coora/Quarry, 1936	14,000	5	185	...	2,372	88,448,762	23.8
		● Galeota, 1972	6,304	...	43	...	3,564	10,686,704	25.5
		Other	...	13	334	...	4,141	653,251,660	...
	TEXACO	● Brighton,† 1908	700- 7,500	3	60	...	468	71,894,163	32.8
		Barrackpore, 1911	1,300-11,100	10	32	...	994	28,446,840	29.9.-41.2
		Guayaguayare, 1902	500-10,750	...	136	...	1,432	84,499,710	33.7
		Forrest Reserve, 1913	500-11,000	9	275	...	4,077	253,416,070	23.0
		Oropouche, 1944	2,700- 9,100	1	31	...	278	6,389,569	38.6
		Palo Seco, 1929	250-12,700	9	78	...	1,833	90,457,530	21.2
		Trinity, 1956	1,400- 9,700	...	17	...	287	14,829,209	32.2
		Other	...	2	44	...	410	57,885,796	...
	TRINTOC	Area IV & Guapo, 1913	10,626	16	52	...	1,301	37,061,703	25.5
		Parrylands, 1913-18	10,626	40	64	...	1,707	37,960,769	30.2
		Point Fortin C & W, 1907-16	10,626	24	96	...	2,157	37,495,494	22.0
		Point Fortin E., 1929	11,000	3	53	...	1,161	25,515,341	22.2
		Penal, 1936	11,067	24	61	...	1,403	60,587,272	22.4
		Catshill, 1950	9,693	1	39	...	416	22,554,720	38.3
		Other	...	14	24	...	629	19,153,520	...
	P.C.O.L	All fields	...	2	88	...	381	19,740,322	...
		Total Trinidad		**329**	**2,816**	...	**162,769**	**2,175,053,876**	
TUNISIA	**ELF AQUITAINE TUNISIE**	● Ashtart	10,500	6	7	2	24,809	140,333,390	29.8
		Douleb/Semmama	1,500- 2,500	...	14	1	1,025	16,505,280	39.3
		Tamesmida	2,500	...	3	...	332	1,701,900	36.8
	CFP	Sidi El Itayem, 1971	7,500- 7,800	...	11	1	2,739	17,985,261	44.0
		Other	...	...	...	...	...	655,000	...
	PETROFINA	Laarich, 1979	8,031	1	...	1	168	116,300	43.3
		Makhrouga, 1980	7,893	3	...	...	1,506	640,000	45.5
		Debbech, 1980	8,202	1	...	...	244	90,200	43.4
	SHELL/AGIP/ETAP	● Tazerka, 1979	4,111- 4,232	4	...	...	9,026	7,305,915	30.0
	AGIP-TUNISIA (Sitep)	El Borma, 1964	8,250- 8,900	53	27	17	73,448	403,958,547	42.5
		Chouech es Saida, 1971	12,600	1	...	...	442	1,940,355	42.9
		Total Tunisia		**69**	**62**	**22**	**113,739**	**591,232,148**	
TURKEY	**TURKSE SHELL**	Barbes, 1971	7,200	...	16	...	1,745	13,335,176	29.7
		Beykan, 1964	5,200	...	26	6	4,230	54,266,450	33.2
		Kayakoy, 1960	6,000	...	14	9	1,664	17,472,444	38.2
		Kayakoy West, 1964	5,300	...	13	5	2,062	25,567,881	34.7
		Sahaban, 1965	5,500	...	4	4	624	12,150,027	34.5
		Malatepe, 1970	5,400	...	10	1	1,171	5,224,856	32.7
		Kurkan, 1963, and Kurkan S., 1965	4,500	...	28	5	3.041	51,155,183	31.4-34.5
		Sıncan, 1979	4,900	...	5	...	488	1,708,834	31.4
		Yatır/Yatir E., 1973	5,246	...	8	3	420	4,251,379	30.9
		Yenikoy E., 1974	NA	...	2	...	470	3,364,391	31.3
		Other	...	...	...	...	...	783,672	...
	MOBIL	Selmo, 1964	3,200	1	17	1	5,147	58,500,000	34.2
		Bulgurdağ	4,500	1	1	2	50	2,400,000	38.0
	TPAO	Raman, 1940	4,500	...	92	2	4,843	42,683,995	18.7
		Bati Raman, 1961	4,200	...	84	7	2,042	31,211,757	13.3
		Garzan, 1956	4,700	...	16	2	1,041	31,001,663	26.2
		Germik, 1968	6,500	...	3	1	90	2,892,457	18.8
		Mağrıp, 1961	5,700	...	9	5	318	14,092,761	18.4
		Silivanka, 1962	8,200	...	8	1	781	6,584,717	23.0
		Beycayir, 1976	7,700	...	1	...	54	130,808	26.1
		Celikli, 1964	10,500	...	3	...	149	775,088	35.2
		Sezgin, 1970	5,600	...	...	...	...	87,559	17.0
		Oyuktas, 1972	7,600	...	...	...	...	592,005	31.0
		Devecatak, 1973	4,800	...	...	...	...	173,202	37.0
		Kuzey Osmancık, 1971	3,800	...	2	...	271	1,676,158	37.6
		Adiyaman, 1971	5,800	...	13	1	412	7,317,376	27.6
		Güney Adiyaman, 1977	5,000	...	...	...	...	115,836	20.4
		Kuzey Adıyaman, 1977	9,500	...	1	...	14	58,085	32.0
		Bölükyayla, 1977	10,300	...	...	1	...	167,663	35.0
		Saricak, 1973	5,250	...	3	...	202	2,258,244	31.5
		Güney Sarıcak, 1973	5,250	...	6	1	293	3,263,804	31.5
		Yeniköy, 1973	6,400	...	10	2	972	7,004,912	31.4
		Güney Kayaköy, 1976	8,600	...	3	...	181	1,622,132	30.4
		Sivritepe, 1977	8,200	...	1	...	54	444,572	33.4
		Camurlu, 1976	5,600	...	5	...	194	533,588	12.2
		Ikiztepe, 1976	4,900	...	...	...	...	88,051	11.3
		Güney Sahaban, 1978	5,450	...	5	...	461	1,326,337	33.2
		Güney Dincer, 1981	5,350	...	17	2	1,728	3,008,003	16.7
		Selmo B., Selmo, 1981	5,500	...	2	...	202	200,898	34.0
		Mehmetdere, 1982	6,700	...	2	2	47	130,943	31.0
		Kartaltepe, 1982	6,550	...	3	...	461	303,356	32.0

*Includes Main Soldado, N. Solado, E. Soldado, and S.W. Soldado. †Includes onshore and offshore production.

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
	Cemberlitas, 1983	9,500	...	4	...	3,088	574,367	30.5
	Alcik	6,500	...	1	...	14	18,936	32.0
ERSAN	Kahta, 1958	3,500	...	...	7	...	3,945,805	11.5
	Total Turkey		**2**	**438**	**70**	**39,024**	**414,465,371**	

UNITED KINGDOM

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
AMOCO	● Montrose, 1969	8,200	7	7	2	15,866	59,329,543	40.5
	● NW Hutton,* 1975	12,000	12	...	...	46,448	23,034,811	36.0
BGC	Wytch Farm, Bridgeport Sands, 1974	2,910	...	8	5	3,000	4,911,000	37.0
	Wytch Farm, Sherwood Sandstone, 1977	5,115	1	...	5	1,500	1,600,000	38.0
BRITOIL	● Thistle, 1973	9,000	30	†13	5	85,617	231,084,923	38.0
	● Beatrice 'A', 1976	6,750	...	13	2	35,895	32,247,304	39.0
	● Beatrice 'B'	...	1	4	1	...	...	...
BP	● Forties, 1970	7,000	52	...	15	412,000	1,361,612,702	37.0
	● Buchan, 1974	8,700	7	...	...	24,600	33,532,809	33.0
	● Magnus, 1974	9,500	8	2	...	110,000	36,687,967	39.0
	East Midlands, 1939	3,500	4	71	98	1,840	23,410,000	40.0
	Kimmeridge, 1960	1,800	...	1	...	226	2,660,000	40.0
CHEVRON	● Ninian, 1974	10,000	59	3	...	41,750	507,240,000	35.0
CONOCO GROUP	● Statfjord,‡ 1974	7,000	20	...	...	67,673	62,384,496	39.0
	● Murchison,¶ 1975	9,900	13	...	2	81,791	107,218,887	37.0
HAMILTON BROS.	● Argyll, 1971	9,000- 9,400	6	...	9	9,500	51,800,000	38.0
	● Duncan, 1980	9,400-10,000	4	...	§2	14,000	4,600,000	36.0
MARATHON	● North Sea, (Brae) South, 1975	12,700-13,437	4	...	...	...	...	...
	Crude	...	...	...	...	78,782	22,336,916	35.0
	NGL	...	...	...	...	5,048	1,039,847	...
MOBIL	● Beryl, 1972	9,900-11,500	18	7	7	83,813	232,704,175	37.4
OCCIDENTAL	● Claymore, 1974	8,100	2	23	1	103,600	205,602,000	29.5
	● Piper, 1973	8,100	14	10	5	165,500	583,326,000	37.2
SHELL	● Auk, 1970	NA	10	...	...	12,780	63,300,000	37.0
	● Brent, 1971	NA	45	...	2	435,297	614,500,000	38.0
	● Cormorant, 1972	NA	7	...	...	31,297	38,000,000	36.0
	● Cormorant N., 1974	NA	NA	...	15	67,648	38,900,000	35.0
	● Dunlin, 1973	NA	19	...	4	70,523	189,700,000	33.0
	● Fulmar, 1975	NA	6	...	1	136,633	87,100,000	41.0
PHILLIPS	● Maureen (North Sea), 1973	8,000- 8,700	11	...	2	85,374	21,370,217	36.0
TEXACO NORTH SEA	● Tartan, 1974	10,217-12,614	4	2	4	30,800	24,500,000	37.0-39.8
UNION OIL	● Heather, 1973	10,800	1	19	1	23,492	47,488,933	33.4
	Total United Kingdom		**365**	**170**	**186**	**2,282,293**	**4,713,223,530**	

*Production began April 1983. †Water injectors. ‡U.K.'s 15.91% share of production from unitized field only. ¶U.K.'s 76.9377% share of production from unitized field only. §Assigned for water injection.

VENEZUELA

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
PDV ANZOATEGUI	Boca, 1971	9,500	8	10	37	2,292	75,773,766	33.0
	Caico Seco, 1946	6,500- 7,300	18	15	67	4,151	63,591,833	37.3
	Chimire, 1948-52	7,000- 7,200	30	28	140	6,352	364,834,619	36.0
	Dacion, 1957	6,700	3	88	53	6,421	212,847,514	21.3
	Elias, 1954	5,000- 6,470	36	30	82	8,357	111,209,424	36.6
	El Roble, 1939	3,500-11,500	9	...	45	1,844	40,137,294	51.3
	Guara, 1946	5,000-10,000	12	58	302	14,091	552,531,146	26.0
	Inca, 1948	7,250	8	11	29	2,009	29,936,604	32.9
	Leona, 1938	2,200-12,800	7	77	215	10,120	182,344,345	21.4
	La Ceiba, 1946	9,450	19	4	13	2,362	44,525,805	43.8
	Mata, 1954	8,970-10,516	39	37	322	13,701	497,622,291	34.1
	Merey, 1937	5,400- 5,700	5	236	232	18,269	239,194,195	11.4
	Nipa, 1945	6,000- 8,500	43	92	280	17,843	495,684,121	29.5
	Oscurote-Norte, 1952	9,513	3	27	45	3,883	121,126,854	22.1
	Oficina, 1937	5,900	25	233	230	19,545	764,546,283	21.6
	Soto, 1950	9,500	43	20	130	6,564	178,991,811	38.9
	Sta. Ana, 1936	8,500	74	3	31	6,464	114,536,139	44.3
	San Joaquin, 1939	6,550	42	1	39	4,273	87,022,088	53.2
	Sta. Rosa, 1941	8,500	129	28	55	17,326	377,114,446	48.4
	Yopales, 1937	4,600	14	124	116	17,299	146,359,337	22.2
	Zanjas, 1958	13,270	9	2	5	...	20,149,109	35.4
	Zapatos, 1955	11,500	25	3	40	4,634	139,590,305	37.0
	Zorro, 1953	11,100	5	14	7	2,408	68,748,830	28.3
	Zulus, 1957	12,710	10	4	7	1,451	22,410,964	39.8
	Zumo, 1954	9,200	2	7	29	874	78,811,962	17.9
	La Ceibita, 1963	9,878	18	3	23	3,733	77,206,641	41.3
	Adjuntas, 1957	5,000	...	...	54	60	10,481,931	13.9
	Other	...	125	319	1,065	39,568	604,648,169	...
MONAGAS	Acema, 1960	...	19	12	28	19,330	80,460,180	23.9
	Aguasay, 1955	8,100-13,400	12	3	18	5,436	108,166,460	41.7
	Jobo, 1956	3,600- 4,000	...	248	172	54,989	219,076,402	12.0
	Morichal, 1958	3,312	...	61	145	7,992	163,416,527	10.6
	Orocual, 1953	2,954	6	8	22	4,100	24,770,500	27.0
	Oritupano, 1950	7,657	...	...	65	8,241	169,466,631	22.8
	Pirital, 1958	450- 1,100	...	62	19	1,571	25,924,347	17.0
	Quiriquire, 1928	7,000- 7,200	...	206	267	6,110	756,919,723	16.3
	Sta. Barbara, 1941	5,020- 6,500	8	41	267	1,347	165,744,496	29.8
	Tacat, 1953	1,820- 3,670	...	52	81	1,347	44,158,784	17.0
	Temblador, 1936	3,500- 4,500	...	22	28	1,274	107,759,354	19.2
	Other	...	82	134	823	31,729	623,586,938	...
ZULIA	Boscan, 1946	...	...	249	185	63,042	677,341,364	10.2
	Bachaquero, 1930	...	19	2,106	1,636	300,171	6,052,385,733	20.2

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	No. of wells			B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
			Flow	Artificial lift	Shut-in			
	Cruces-Manueles, 1916	3,000- 8,000	1	...	130	556	173,265,337	30.9
	Cabimas, 1917	2,200	9	703	498	52,598	1,531,048,756	23.4
	Centro, 1959	9,600-11,000	22	79	64	88,762	709,704,477	35.6
	La Concepcion, 1953	3,148- 8,000	2	67	96	3,322	131,324,480	35.1
	La Paz, 1925	4,268- 8,000	9	58	89	14,602	839,461,174	30.5
	Lago, 1959	11,450	20	...	44	13,583	210,275,742	31.7
	Lagunillas, 1926	3,000	101	3,263	1,751	338,923	10,237,754,060	21.5
	Lama, 1937	8,320	9	54	35	118,864	2,372,902,172	32.8
	Lamar, 1958	13,000	37	49	83	61,799	1,027,049,974	34.5
	Mara, 1945	5,240	4	30	71	7,968	403,467,637	22.0
	Mene Grande, 1914	4,130	...	312	272	12,418	625,966,416	18.4
	Motatan, 1952	...	5	12	10	21,304	48,093,022	20.3
	Sibucana, 1948	13,450	...	1	2	422	42,556,646	32.2
	Tia Juana, 1928	3,000	12	2,350	651	201,284	3,695,948,482	17.9
	Urdaneta, 1970	10,000	...	...	2	51,384	76,535,999	23.3
	West-Tarra, 1942	4,250- 5,500	4	8	29	1,650	69,205,990	41.3
	Other	...	184	236	517	44,824	448,181,634	...
BARINAS	Hato, 1965	9,550	1	14	2	2,950	40,190,361	27.3
	Maporal, 1957	10,950	..	9	2	2,217	11,176,216	28.9
	Paez, 1963	NA	...	51	9	12,794	49,425,374	20.2
	Silvan, 1949	10,860	1	13	1	2,758	44,098,295	29.3
	Silvestre, 1948	8,860	...	32	15	5,241	131,255,412	25.3
	Sinco, 1953	8,500- 9,100	1	54	27	10,236	245,180,543	24.0
	Other	...	1	6	6	480	4,517,465	...
FALCON	All fields	...	...	9	127	278	107,085,756	24.7
GUARICO	Budare, 1958	4,523	9	17	20	4,180	64,299,106	31.5
	Las Mercedes, 1942	4,500	2	25	157	754	132,735,479	28.8
	Ruiz, 1949	4,500	1	12	29	404	32,937,647	32.0
AMACURO	Tucupita	...	25	3	39	1,052	48,657,587	16.6
	Total Venezuela		**1,387**	**12,145**	**12,227**	**1,820,180**	**38,496,546,503**	

WEST GERMANY

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
BAVARIA	Arlesried, 1964	4,900		116	...	875	12,291,819	47.0
	Moenchsrot, 1958	4,800			...	350	11,150,543	36.0
	Other	...			...	3,290	31,962,696	...
EMSLAND	Emlichheim, 1964	2,600		1,106	...	3,343	39,996,439	25.0
	Georgsdorf, 1944	1,800- 2,600			...	7,614	94,007,645	24.0-29.0
	Meppen-Schwefingen, 1960	4,000			...	1,016	11,016,841	28.0-30.0
	Ruehlermoor, 1949	2,000- 4,700			...	10,027	127,739,910	28.0-30.0
	Ruehlertwist, 1949	2,350- 2,900			...	1,665	29,157,267	25.0
	Scheerhorn, 1949	3,550- 3,750			...	3,219	46,982,364	30.0
	Other	...			...	1,456	28,889,297	...
SCHLESWIG-HOLSTEIN	Ploen-Ost, 1959	6,400		212	...	1,692	47,357,214	36.0
	Preetz, 1962	8,350- 8,550			...	510	10,407,585	29.0
	Reitbrook, 1937	1,450- 2,100			...	1,309	36,892,384	29.0
	Other	...			...	1,859	50,187,647	...
HANOVER	Eldingen, 1949	4,750		858	...	888	18,273,523	35.0
	Hankensbuettel, 1954	4,450- 5,100			...	4,905	87,824,817	33.0
	Hardesse, 1958	4,300- 5,900			...	1,199	8,634,740	34.0
	Hohne, 1958	4,300- 5,900			...	849	37,888,344	33.0-34.0
	Knesebeck, 1958	5,100- 5,200			...	1,276	16,720,618	36.0
	Leiferde, 1956	2,600			...	460	19,561,708	34.0
	Lueben, 1955	3,950			...	792	10,664,715	35.0-38.0
	Meckelfeld, 1938	1,000- 1,300			...	427	13,704,426	24.0-32.0
	Oelheim-Sued, 1968	7,650			...	642	6,412,299	33.0
	Orrel-Wesendorf-Nord, 1954	4,450			...	1,020	11,531,609	...
	Ruehme, 1954	1,950			...	939	8,943,610	...
	Sinstorf, 1960	6,750- 7,150			...	799	17,719,474	...
	Suderbruch, 1949	3,750- 7,550			...	704	22,022,052	19.0-36.0
	Vorhop, 1952	2,950- 6,900			...	1,110	15,331,143	36.0
	Other	...			...	3,093	220,231,421	...
UPPER RHINE VALLEY	Landau, 1955	3,950- 4,800		120	...	1,318	23,627,251	36.0
	Other	...			...	296	11,959,860	...
WESER-EMS	Barenburg, 1953	2,300- 3,300		724	...	2,987	33,740,949	29.0
	Bollstedt, 1954	3,750			...	1,454	18,955,675	...
	Bramberge, 1958	2,560- 3,300			...	6,492	87,820,572	29.0
	Dueste, 1954	2,600- 4,250			...	1,619	39,104,188	...
	Gross Lessen, 1969	3,300			...	1,274	20,286,270	...
	Sued-Oldenburg, 1950	1,700- 6,500			...	1,553	37,452,518	...
	Voigtei, 1953	1,150- 1,500			...	891	23,299,367	31.0-34.0
	Wehrbleck, 1947	3,400			..	818	14,838,975	33.0
	Other	...			...	1,997	29,776,194	...
	Total West Germany			**3,138**	**...**	**78,027**	**1,434,385,988**	

ZAIRE

WORLDWIDE PRODUCTION	Name of field, discovery date	Depth, feet	Flow	Artificial lift	Shut-in	B/d average first 6 mo. 1984	Cumulative bbl to July 1, 1984	°API gravity
GULF OIL	• GCO, 1970	7,000- 9,000	6	...	7	643	5,607,403	29.0
	• Mibale, 1973	5,000- 6,000	...	7	1	23,691	60,256,204	30.0
	• Mwambe, 1979	6,150	...	1	1	...	401,625	30.4
	• Motoba, 1976	11,098	1	...	...	...	112,487	44.3
	Lukami	12,400	1	...	...	2,960	446,886	35.0
	Total Zaire		**8**	**8**	**9**	**27,294**	**66,824,605**	

UNITED STATES

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
	——	1,000 bbl	——	
ALABAMA				
Citronelle, 1955	1,900	139,513	15,000	446
ALASKA*				
Granite Point, 1965	3,360	97,873	20,883	27
Kuparuk, 1971	37,230	109,583	†1,051,817	115
McArthur River, 1965	11,638	498,950	51,362	62
Middle Ground Shoal, 1963	3,129	143,843	14,765	37
Prudhoe Bay, 1968§	569,671	3,796,847	5,669,973	446
Swanson River, 1968	2154	200,722	13,846	39
ARKANSAS				
Smackover, 1922	3,972	543,240	20,000	2,160
CALIFORNIA*				
San Joaquin Valley				
Belridge South, 1911	47,048	434,423	316,852	4,508
Buena Vista, 1909	1,959	642,632	16,841	1,175
Coalinga, 1890	10,131	711,604	73,469	2,198
Coalinga Nose, 1938	1,500	492,802	14,702	77
Coles Levee North, 1938	74	158,494	8,261	97
Cuyama, 1949	609	216,041	805	128
Cymric, 1909	5,583	171,903	40,000	900
Edison, 1928	1,300	128,802	35,160	795
Elk Hills, 1911	49,405	727,223	745,795	1,242
Fruitvale, 1928	984	112,003	8,716	375
Greeley, 1936	292	111,591	1,115	41
Kern Front, 1912	3,083	165,204	21,917	1,026
Kern River, 1899	49,722	1,016,168	970,000	5,863
Kettleman North Dome, 1928	206	455,581	1,071	59
Lost Hills, 1910	5,297	157,812	79,803	1,643
McKittrick, 1896	4,316	253,748	25,384	1,220
Midway-Sunset, 1894	50,793	1,652,120	500,000	8,931
Mount Poso, 1926	7,296	234,471	60,404	552
Rio Bravo, 1937	333	115,411	156	18
Coastal Area				
Cat Canyon E. & W., 1908	4,722	274,003	60,998	771
Dos Cuadras, 1969	6,107	192,918	61,243	144
Elwood, 1928	222	104,266	648	7
Hondo, 1969	11,330	45,646	—†	15
Orcutt, 1901	1,158	161,909	14,203	177
Rincon, 1927	1,522	143,045	9,441	253
San Ardo, 1947	7,747	383,500	14,623	763
Santa Maria Valley, 1934	2,716	189,959	485,238	212
South Mountain, 1916	956	142,807	15,224	384
Ventura, 1919	7,305	865,041	125,985	571
Los Angeles Basin				
Beta, 1976	4,800	13,078	—§	32
Beverly Hills, 1900	3,150	113,132	21,163	126
Brea Olinda, 1880	264	374,617	65,373	739
Coyote East, 1909	661	106,158	4,211	140
Coyote West, 1909	1,056	246,389	4,648	137
Dominguez, 1923	723	266,681	6,136	118
Huntington Beach, 1920	8,536	1,038,849	80,091	1,006
Inglewood, 1924	3,523	332,846	60,793	411
Long Beach, 1921	2,700	898,529	28,161	408
Montebello, 1917	462	190,488	3,003	148
Richfield, 1919	1,608	182,022	9,490	240
Santa Fe Springs, 1919	956	608,908	9,764	165
Seal Beach, 1924	1,314	198,452	4,927	177
Torrance, 1922	2,486	205,654	8,566	380
Wilmington, 1932	40,919	2,151,828	400,000	2,198
COLORADO*				
Rangely, 1933	13,438	691,175	32,103	545
FLORIDA				
Jay, 1970	8,455	335,690	77,200	114
ILLINOIS*				
Clay City, 1938	3,100	339,341	8,500	2,615
Lawrence, 1906	2,500	381,688	5,671	2,700
Louden, 1938	1,745	382,105	4,000	1,340
Main, 1906	1,760	225,388	2,800	3,356
New Harmony, 1939	1,500	150,196	1,700	1,140
Salem, 1938	2,490	379,517	4,000	1,325
KANSAS*				
Bemis-Shutts, 1928	1,530	235,397	2,603	902
Chase-Silica, 1931	1,487	262,265	3,900	1,147
Eldorado, 1917	1,075	291,161	3,600	856
Hall-Gurney, 1931	1,286	140,828	3,700	1,131
Trapp, 1937	1,511	221,660	3,200	979
LOUISIANA				
Offshore				
Bay Marchand Blk. 2, 1949	7,465	571,868	78,732	171
Eugene Island Blk. 330, 1971	11,836	231,151	93,849	178
Grande Isle Blk. 16, 1948	2,994	252,959	96,415	77
Grand Isle Blk. 43, 1956	6,770	249,643	108,057	117
Main Pass Blk. 306, 1969	2,875	192,982	87,222	199
Main Pass Blk. 41, 1957	3,356	226,238	35,000	302
Main Pass 69, 1948	3,000	225,000	97,000	123
Mississippi Canyon Blk. 194, 1980	24,687	68,162	125,000	55
Ship Shoal Blk. 204, 1968	2,162	59,166	45,834	38
Ship Shoal, Blk. 207, 1967	2,207	81,357	45,382	48
Ship Shoal Blk. 208, 1962	3,281	142,092	83,351	53
South Pass Blk. 24, 1950	5,600	450,540	40,000	390
South Pass Blk. 27, 1954	3,207	116,943	81,572	215
South Pass Blk. 61, 1968	12,417	111,485	63,515	165
South Pass Blk. 62, 1965	3,674	95,074	92,885	62
South Pass Blk. 65, 1969	2,178	88,913	101,214	50
South Timbalier Blk. 21, 1939	4,279	205,372	58,000	67
South Timbalier Blk. 135, 1956	979	134,005	30,995	41
West Delta Blk. 30, 1949	10,617	413,458	80,000	188
West Delta Blk. 73, 1962	2,603	174,588	100,402	73
Onshore South				
Bay de Chene, 1941	926	95,335	19,424	45
Bay St. Elaine, 1928	333	163,256	26,844	51
Bayou Sale, 1941	631	157,712	6,972	18
Black Bay, West, 1953	2,833	136,667	17,852	86
Caillou Island, 1930	3,036	590,894	84,308	193

*Some production and reserves data provided by Alaska Oil & Gas Conservation Commission, including corrections of OGJ estimates last year. †OGJ estimate. Other estimates for reserves in Kuparuk River pool alone reach 500-750 million bbl of oil. §Includes about 11.86 million bbl of condensate.

*Some production and reserves data supplied by California Division of Oil & Gas, including corrections of OGJ estimates last year. †Hondo reserves identified thus far are pegged at about 94 million bbl of oil, but western portion of field and the other two fields in the Santa Ynez Unit, Sacate and Pescado, are yet to be developed. Combined potential reserves of the unit are conservatively estimated at about 400 million bbl of oil. §At least 196 million bbl of oil reserves have been identified thus far in Beta field. Further development under way, with ultimate recovery pegged at as much as 300 million bbl of oil.

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
	1,000 bbl			
Cote Blanche Bay, West, 1940	777	178,842	49,135	160
Delta Farms, 1944	325	114,437	7,936	23
Garden Island Bay, 1934	1,861	214,772	38,547	165
Golden Meadow, 1938	980	131,657	7,584	221
Grand Bay, 1938	967	168,171	6,103	73
East Hackberry, 1927	1,286	105,136	11,382	60
West Hackberry, 1928	1,742	133,602	14,785	124
Iowa, 1931	187	95,565	773	24
Jennings, 1901	452	114,906	1,931	146
Lafitte, 1935	1,913	247,809	17,015	177
Lake Barre, 1929	1,038	200,066	24,246	65
Lake Pelto, 1929	529	114,734	19,710	40
Lake Washington, 1931	2,659	232,716	26,085	100
Leeville, 1931	536	139,170	9,789	49
Paradis, 1939	784	122,484	12,194	34
Quarantine Bay, 1937	1,309	169,150	5,134	65
Timbalier Bay, Onshore, 1938	1,509	268,834	27,305	114
Venice, 1937	1,122	178,459	11,010	62
Vinton, 1910	72	134,082	2,083	116
Weeks Island, 1945	879	221,840	25,511	47
West Bay, 1940	2,143	221,408	23,193	127
North				
Caddo-Pine Island, 1905	4,107	345,678	16,000	9,217
Delhi, 1944	1,354	207,629	38,729	116
Haynesville, 1921	1,410	164,242	1,886	302
Homer, 1919	399	96,682	3,601	117
Rodessa, 1935	483	105,016	2,517	65

MISSISSIPPI

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Baxterville, 1944	5,412	224,950	20,000	303
Heidelberg, 1944	4,092	157,357	18,000	306
Tinsley, 1939	1,400	215,612	5,000	182

MONTANA*

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Bell Creek, 1967	2,362	124,585	27,888	204
Cut Bank, 1926	1,115	158,329	41,161	634
Pine, 1951	1,766	99,264	11,458	99

NEW MEXICO

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Denton, 1949	835	135,639	4,063	130
Empire Abo, 1957	2,500	212,688	57,312	190
Eunice-Monument, 1929	3,570	163,878	16,430	1,000
Hobbs, 1928	6,387	267,097	28,000	410
Maljamar, 1926	2,213	137,216	12,815	760
Vacuum, 1929	17,545	376,133	40,000	1,090

NORTH DAKOTA*

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Beaver Lodge, 1951	2,101	105,146	15,449	157
Billings Nose				
Four Eyes, 1978	271	4,338		14
Big Stick, 1979	3,114	27,682	62,739	55
T-R, 1978	1,706	10,094		65
Little Knife, 1977	5,069	35,606	67,485	153
Mondak, 1976	1,016	11,074	87,569	179

OKLAHOMA*

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Burbank, 1920	1,961	529,565	13,950	1,058
Eola-Robberson, 1947	1,219	128,281	12,000	601
Fitts, 1933	3,272	181,748	9,400	601
Glenn Pool, 1905	1,109	323,183	7,402	1,118
Golden Trend, 1945	4,319	438,697	25,331	1,301
Healdton, 1913	1,987	333,271	16,622	1,237
Hewitt, 1919	2,633	263,080	23,607	1,276
Oklahoma City, 1928	597	740,973	8,500	174
Postle, 1960	1,548	101,039	20,039	318
Sho-Vel-Tum, 1914	19,292	NA	101,000	8,506
Sooner Trend, 1965	6,534	266,164	28,935	5,314

TEXAS

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
District 2				
Greta, 1933	1,224	143,924	16,176	135
Lake Pasture, 1953	2,364	73,868	21,560	165
Tom O'Connor, 1934	17,220	694,964	106,036	789
West Ranch, 1938	3,552	367,536	16,500	380
District 3				
Anahuac, 1935	1,788	279,048	20,952	141
Conroe, 1931	6,948	705,943	55,000	339
Giddings, 1971	20,200	213,856	211,144	2,539
Hastings, 1934	5,000	681,080	88,920	318
Magnet Withers, 1936	1,968	103,148	9,000	174
Oyster Bayou, 1941	1,284	156,136	22,164	43
Thompson, 1931	4,728	455,524	44,376	274
Tomball, 1933	612	118,924	12,000	118
Webster, 1937	5,580	551,172	26,000	171
District 5				
Van, 1928	2,832	506,540	13,252	400
District 6				
East Texas, 1930	50,808	4,833,377	1,164,128	10,865
Fairway, 1960	3,312	180,468	30,000	99
Hawkins, 1940	13,248	778,500	80,000	468
Neches, 1953	2,500	96,888	13,000	140
Quitman, 1948	2,088	113,816	16,000	223
District 8				
Andector, 1946	2,820	171,364	14,180	66
Block 31, 1945	4,920	203,156	19,000	275
Cowden, N., 1930	14,088	431,740	60,000	1,252
Cowden, S., Foster, Johnson, 1932	11,232	461,160	40,000	1,618
Dollarhide, 1945	2,364	184,072	16,428	168
Dune, 1938	3,816	170,748	22,116	863
Fullerton, 1942	6,672	317,984	35,000	759
Goldsmith, 1934	9,300	723,820	59,480	1,623
Howard Glasscock, 1925	6,000	381,840	34,000	2,280
Iatan, E., 1926	3,660	129,012	16,340	1,198
Jordan, 1937	1,236	124,896	6,304	300
Keystone, 1930	2,232	304,692	17,768	851
McElroy, 1926	9,528	433,809	78,432	2,043
Means, 1934	5,412	201,622	31,528	545
Midland Farms, 1944	4,224	223,200	30,000	333
Sand Hills, 1931	4,000	235,811	34,000	1,453
TXL, 1944	1,500	256,388	8,292	633
Waddell, 1927	996	97,676	7,324	206
Ward Estes, N., 1927	4,572	349,237	25,000	1,620
Yates, 1926	46,860	1,014,066	940,439	880
District 8-A				
Anton-Irish, 1944	5,232	159,108	40,992	247
Cogdell Area, 1949	2,256	260,256	48,976	115
Diamond M, 1948	2,640	230,478	25,000	484
Kelly-Snyder, 1948	20,268	1,176,074	173,926	1,012
Levelland, 1938	16,464	412,936	65,000	2,510
Prentice, 1951	4,212	140,000	26,000	369
Salt Creek, 1950	7,200	215,972	43,920	149
Seminole, 1936	15,720	463,192	60,000	508
Slaughter, 1936	25,236	944,900	80,000	2,957
Spraberry Trend, 1951	20,280	566,004	70,000	6,453
Wasson, 1936	37,344	1,586,174	90,000	2,102
Welch, 1942	4,020	130,640	25,000	543
District 10				
Panhandle, 1921	10,632	1,388,354	56,172	12,090

UTAH*

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Altamont 1955	4,081	71,852	245,866	201
Aneth, 1956	6,071	330,963	37,869	470
Red Wash 1951	2,226	118,581	18,740	224
E. Anschutz Ranch, 1979	10,609	17,707	783,010	9
Pineview, 1975	883	24,087	121,378	24

WYOMING*

State Field Disc. date	1984 prod.	Cum. prod. 1-1-85	Est. rem. reserves	Est. No. wells
Brady, 1960	3,366	42,730	60,963	9
Byron, 1918	2,350	114,493	13,702	54
Elk Basin, 1915	3,383	434,338	38,218	191
Garland, 1906	2,966	151,356	5,034	247
Grass Creek, 1914	2,561	175,296	18,297	275
Hamilton Dome, 1918	3,236	255,886	7,207	254
Hartzog Draw, 1976	3,437	41,391	308,306	129
Hilight, 1969	870	73,084	58,207	115
Lance Creek, 1918	100	107,457	309	31
Lost Soldier, 1916	3,317	181,837	11,143	89
Oregon Basin, 1912	9,126	351,670	52,879	480
Palmer Resv., 1979	7,263	27,327	97,911	40
Salt Creek, 1906	5,832	620,512	19,168	1,131
Whitney Canyon-Carter Creek, 1980	1,075	2,836	112,290	2

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*Production data furnished by Petroleum Information, Denver. Reserve data by OGJ.

PRODUCTION BY FIELDS

USSR

Field, year discovered	No. wells	1984 prod. (million bbl)	Cum. prod. 1-1-85 (million bbl)	Pay, ft.
Arlan, 1955	3,000	55	2,292	Carb., 4,429
Baku Archipelago, 1963	720	20	411	Pliocene, 8,773
Fedorovskoye, 1971	1,400	265	1,606	L. Cret., 5,900
Kholmogorskoye, 1973	600	65	287	L. Cretaceous
Kotur-Tepe, 1956	350	30	1,500	Pliocene, 8,793
Mamontovo, 1965	1,400	225	1,609	Cretaceous, 6,300
Neftyanye Kamni, 1949	1,200	20	1,063	Pliocene, 5,406
Pravdinsk, 1964	500	55	773	L. Cret., 8,580

Field, year discovered	No. wells	1984 prod. (million bbl)	Cum. prod. 1-1-85 (million bbl)	Pay, ft.
Romashkino, 1948	8,000	350	13,090	Devonian, 5,791
Samotlor, 1965	4,700	1,050	11,085	L. Cret., 7,306
Sovetskoye, 1962	300	48	796	Cret., 11,130
Usa, 1963	1,000	120	750	Paleozoic, 6,510
Ust-Balyk, 1961	1,000	78	1,440	L. Cret., 6,865
Uzen, 1961	1,000	72	1,420	Jurassic, 2,667
Yuzhno-Surgut, 1973	500	76	454	L. Cret.
Zapadno-Surgut, 1962	250	26	504	Cret., 7,628

Primary energy production

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	Crude oil	NGL	Natural gas	Coal	Hydro-electric	Nu-clear
	Quadrillion BTU											% to total 1983					
U.S.	61.95	60.72	59.73	59.80	60.06	60.98	63.66	64.59	64.25	63.74	61.04	30.1	3.6	26.9	28.3	5.8	5.3
Canada	9.50	9.38	8.89	8.73	9.16	9.26	9.95	10.13	9.86	9.99	10.27	29.8	5.1	22.4	10.1	26.7	5.7
Mexico	1.87	2.15	2.44	2.76	3.16	3.79	4.55	5.85	6.85	7.89	7.95	74.1	5.3	15.6	1.9	3.0	NA
North America	**73.32**	**72.25**	**71.06**	**71.30**	**72.38**	**74.02**	**78.16**	**80.58**	**80.96**	**81.62**	**79.26**	**34.5**	**4.0**	**25.2**	**23.3**	**8.2**	**4.8**
Argentina	1.20	1.24	1.23	1.24	1.31	1.40	1.45	1.55	1.56	1.66	1.73	62.4	0.6	23.6	NA	10.9	1.7
Brazil	1.03	1.15	1.24	1.32	1.44	1.53	1.76	1.94	1.98	2.23	2.50	27.6	0.8	NA	7.2	62.4	NA
Venezuela	8.13	7.29	5.90	5.79	5.70	5.49	5.94	5.66	5.56	5.14	4.85	80.8	2.3	13.4	NA	3.5	NA
Other Latin America	2.49	2.40	2.26	2.43	2.55	2.98	3.21	2.99	2.96	2.88	2.87	60.3	1.4	15.3	NA	18.5	NA
Latin America	**12.85**	**12.09**	**10.62**	**10.78**	**11.00**	**11.39**	**12.36**	**12.14**	**12.06**	**11.91**	**11.94**	**62.1**	**1.4**	**12.6**	**3.2**	**28.5**	**0.3**
France	1.78	1.82	1.88	1.71	2.00	2.02	2.03	2.26	2.75	2.72	3.08	NA	1.0	6.8	16.9	24.0	49.0
Italy	1.06	1.07	1.08	1.11	1.15	1.13	1.10	1.07	1.12	1.13	1.08	NA	NA	38.9	NA	42.6	6.5
Netherlands	2.52	2.86	3.16	3.44	2.90	2.49	2.69	3.33	3.11	2.67	2.84	NA	0.4	94.4	NA	NA	1.4
Norway	0.83	0.88	1.22	1.50	1.49	2.10	2.71	3.06	3.12	3.20	3.56	36.5	3.7	28.7	NA	30.6	NA
Spain	0.69	0.77	0.73	0.71	0.92	0.96	1.06	0.98	1.02	1.17	1.27	NA	NA	NA	57.5	23.6	8.7
United Kingdom	4.66	4.47	4.97	5.49	6.69	7.31	8.41	8.56	8.91	9.51	9.98	49.3	1.6	13.8	20.6	7.0	6.1
West Germany	4.92	4.95	4.87	4.96	4.96	4.97	5.26	5.25	5.38	5.46	5.34	NA	NA	11.0	69.9	3.6	12.0
Other Western Europe	3.14	3.20	3.45	3.37	3.80	3.83	4.16	4.14	4.49	4.69	4.86	NA	0.2	2.7	28.0	40.9	20.6
Western Europe	**19.58**	**20.01**	**21.36**	**22.29**	**23.90**	**24.81**	**27.40**	**28.66**	**29.90**	**30.55**	**32.01**	**22.6**	**1.8**	**28.1**	**28.7**	**15.1**	**12.4**
Iran	13.27	13.68	12.23	13.43	12.88	11.93	7.44	3.87	3.21	5.04	5.62	92.7	0.2	5.9	NA	NA	NA
Iraq	4.35	4.25	4.89	5.25	5.08	5.44	7.37	5.36	2.13	2.16	2.14	98.1	0.5	1.4	NA	NA	NA
Kuwait	6.75	5.67	4.68	4.85	4.47	4.87	5.68	3.87	2.63	1.95	2.52	91.3	3.6	5.2	NA	NA	NA
Saudi Arabia	16.63	18.68	15.68	18.95	20.57	18.48	21.25	22.31	22.11	14.72	11.57	93.8	4.5	1.7	NA	NA	NA
United Arab Emirates	3.27	3.56	3.56	4.20	4.45	4.09	4.11	3.89	3.45	2.99	2.82	85.8	6.7	7.4	NA	NA	NA
Other Middle East	2.34	2.49	2.53	2.54	2.40	2.39	2.57	2.44	2.40	2.27	2.30	81.7	2.2	14.7	NA	NA	NA
Middle East	**46.61**	**48.33**	**43.58**	**49.20**	**49.84**	**47.21**	**48.42**	**41.73**	**35.93**	**29.14**	**26.98**	**91.8**	**3.9**	**4.6**	**NA**	**NA**	**NA**
Algeria	2.47	2.35	2.34	2.63	2.68	3.22	3.15	2.91	2.61	2.71	3.05	45.2	13.1	41.6	NA	NA	NA
Egypt	0.41	0.39	0.58	0.82	1.04	1.21	1.30	1.45	1.47	1.68	1.83	85.8	2.2	NA	NA	5.5	NA
Libya	4.72	3.32	3.27	4.26	4.53	4.36	4.59	3.98	2.57	2.58	2.43	91.8	2.1	6.1	NA	NA	NA
Nigeria	4.45	4.89	3.88	4.51	4.50	4.06	4.95	4.43	3.15	2.83	2.71	98.7	NA	NA	NA	NA	NA
South Africa	1.48	1.57	1.65	1.84	2.03	2.15	2.53	2.86	3.22	3.38	3.59	NA	NA	NA	99.7	NA	NA
Other Africa	1.27	1.41	1.46	1.33	1.60	1.46	1.56	1.91	1.86	1.92	2.10	71.9	NA	9.5	8.6	20.9	NA
Africa	**14.81**	**13.93**	**13.19**	**15.39**	**16.39**	**16.47**	**18.08**	**17.54**	**14.88**	**15.10**	**15.72**	**59.2**	**3.1**	**18.3**	**24.0**	**3.4**	**NA**
Australia	3.25	3.44	3.64	3.79	4.08	4.20	4.68	4.64	5.16	4.88	5.03	17.4	2.2	8.3	69.2	2.8	NA
India	2.22	2.36	2.68	2.84	2.90	3.09	3.15	3.15	3.79	4.08	4.02	21.1	NA	NA	61.9	13.7	0.7
Indonesia	2.90	2.99	2.90	3.38	3.85	3.72	3.84	4.12	4.22	3.66	3.85	75.3	4.2	20.0	NA	NA	NA
Japan	1.53	1.70	1.82	1.87	1.66	1.91	2.06	2.33	2.30	2.43	2.44	NA	NA	2.5	16.4	35.7	44.7
North Korea	1.15	1.22	1.27	1.30	1.31	1.33	1.41	1.48	1.48	1.56	1.59	NA	NA	NA	82.4	17.6	NA
Other Far East	1.96	2.08	2.29	2.60	2.75	2.89	3.29	3.59	3.48	3.71	4.09	31.3	NA	22.3	19.8	12.2	6.6
Far East	**13.01**	**13.79**	**14.60**	**15.78**	**16.55**	**17.14**	**18.43**	**19.31**	**20.43**	**20.32**	**21.02**	**28.1**	**1.5**	**12.2**	**40.4**	**11.5**	**6.6**
Non-Communist	**180.18**	**180.39**	**174.41**	**184.94**	**189.96**	**191.03**	**202.82**	**199.96**	**194.16**	**188.64**	**186.93**	**43.8**	**2.8**	**17.8**	**21.6**	**8.9**	**4.9**
China	13.14	14.25	15.11	15.93	16.77	18.74	19.23	19.01	18.78	19.87	20.14	22.6	NA	2.1	71.4	3.9	NA
Czechoslovakia	1.74	1.78	1.83	1.86	1.91	1.94	1.96	1.98	1.98	2.03	2.05	NA	NA	NA	93.2	2.0	3.4
East Germany	2.19	2.19	2.20	2.26	2.30	2.28	2.36	2.44	2.53	2.57	2.60	NA	NA	3.8	90.8	NA	4.6
Poland	4.94	5.09	5.37	5.59	5.81	6.02	6.21	6.03	5.10	5.81	5.87	NA	NA	3.4	95.9	NA	NA
Romania	2.14	2.19	2.30	2.39	2.49	2.34	2.48	2.49	2.56	2.68	2.79	18.6	1.0	54.4	21.9	4.3	NA
USSR	39.28	41.77	43.62	46.16	48.43	50.68	52.42	54.41	55.35	57.14	58.23	41.0	1.0	30.3	23.1	3.1	15.6
Other Communist	1.16	1.15	1.20	1.25	1.30	1.33	1.32	1.34	1.36	1.50	1.53	18.3	2.0	19.6	49.7	6.5	9.8
Communist	**64.59**	**68.42**	**71.63**	**75.44**	**79.01**	**83.31**	**85.98**	**87.70**	**87.66**	**91.60**	**93.21**	**31.3**	**0.7**	**21.6**	**41.9**	**3.1**	**1.3**
Total World	**244.78**	**248.81**	**246.03**	**260.40**	**268.96**	**274.35**	**288.82**	**287.64**	**281.84**	**280.22**	**280.14**	**39.7**	**2.1**	**19.1**	**28.4**	**7.0**	**3.7**

NA — Not available

Columns may not add due to rounding

Source: Energy Information Administration

PIONEERING FLOATER Kulluk drills ahead on Pitsiulak wildcat in the Canadian Beaufort Sea. Opoerated by BeauDril Ltd., a subsidiary of Gulf Canada Resources, it outlasted more conventional floaters in unusually severe ice.

International Active Rig Count

Region	1977	1978	1979	1980	1981	1982 Land	1982 Off.	1982 Total	1983 Land	1983 Off.	1983 Total	1984 Land	1984 Off.	1984 Total
NORTH AMERICA														
Canada	218	272	339	401	264	195	5	200	190	11	201	245	14	259
United States	2,001	2,255	2,176	2,910	3,970	2,861	244	3,105	2,030	199	2,229	2,216	213	2,429
Subtotal	**2,219**	**2,527**	**2,515**	**3,312**	**4,233**	**3,056**	**249**	**3,305**	**2,220**	**210**	**2,430**	**2,461**	**227**	**2,688**
LATIN AMERICA														
Argentina	68	72	63	76	70	65	2	67	72	1	73	82	0	82
Barbados	0	0	0	0	1	1	0	1	1	0	1	1	0	1
Bolovia	6	6	6	4	11	11	0	11	8	0	8	6	0	6
Brazil	45	52	60	72	82	63	31	94	54	29	93	44	25	69
Chile	5	5	6	7	7	4	3	7	3	3	6	3	3	6
Columbia	11	11	15	14	22	22	1	23	18	1	19	16	0	16
Costa Rica	0	0	0	0	0	6	0	6	1	0	1	1	0	1
Dominican Republic	0	0	0	0	1	1	0	1	0	0	0	0	0	0
Ecuador	1	1	3	3	4	5	1	6	5	1	6	4	0	4
Guatemala	3	1	1	4	7	5	0	5	1	0	1	1	0	1
Mexico	148	167	205	215	218	180	22	202	160	27	187	166	30	196
Paraguay	1	1	0	0	1	1	0	1	0	0	0	0	0	0
Peru	13	16	20	21	24	18	6	24	10	5	15	10	7	17
Trinidad	15	17	14	13	14	8	6	14	6	4	10	6	3	9
Uruguay	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Venezuela	20	33	47	52	63	52	18	70	29	12	41	21	9	30
Subtotal	**336**	**380**	**440**	**480**	**521**	**434**	**87**	**521**	**368**	**82**	**450**	**361**	**77**	**438**
FAR EAST														
Bangladesh	2	3	2	3	5	5	0	5	2	0	2	4	0	4
Brunei	7	8	8	8	7	3	7	10	3	7	10	2	7	9
Burma	17	16	22	26	30	32	1	33	35	1	36	32	1	33
China-offshore	0	0	8	12	9	—	10	10	—	10	10	—	9	9
India	43	40	40	43	44	41	10	51	41	14	55	40	17	57
Indonesia	46	62	66	77	87	60	32	92	62	25	87	56	26	82
Japan	14	13	15	16	16	18	4	22	18	2	20	15	3	18
Korea	1	1	0	0	0	0	0	0	1	0	1	0	0	0
Malaysia	8	11	13	12	12	0	13	13	0	10	10	0	9	9
North Korea	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Pakistan	5	8	13	14	15	17	0	17	17	0	17	17	0	17
Philippines	6	6	15	12	13	12	3	15	7	1	8	3	0	3
Sri Lanka	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Taiwan	11	9	10	12	11	4	1	5	7	1	8	5	1	6
Thailand	1	2	2	5	7	3	5	8	6	6	12	5	6	11
Viet Nam	0	0	2	1	0	0	0	0	0	0	0	0	0	0
Subtotal	**166**	**179**	**217**	**240**	**258**	**193**	**84**	**277**	**196**	**67**	**263**	**179**	**69**	**248**

International Active Rig Count (continued)

Region	1977	1978	1979	1980	1981	1982			1983			1984		
						Land	Off.	Total	Land	Off.	Total	Land	Off.	Total
AFRICA														
Algeria	108	101	109	111	91	81	0	81	53	0	53	27	0	27
Angola	1	2	6	5	7	3	8	11	3	9	12	2	5	7
Benin	0	0	0	0	0	0	1	2	0	1	1	0	1	1
Cameroon	2	2	4	6	7	1	6	7	1	5	6	0	4	4
Chad	1	1	1	1	1	1	0	1	1	0	1	0	0	0
Congo	2	1	1	4	7	2	5	7	1	5	6	0	3	3
Gabon	6	4	6	8	14	13	9	12	1	7	8	1	6	7
Ghana	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Guinea Republic	0	0	0	0	0	0	1	1	0	1	1	0	0	0
Ivory Coast	1	2	3	3	5	0	5	5	0	2	2	0	2	2
Kole	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Libya	23	28	33	41	33	29	2	31	22	2	24	24	2	26
Morocco	4	4	3	2	5	5	1	6	6	0	6	4	0	4
Niger	3	4	5	5	5	3	0	3	1	0	1	0	0	0
Nigeria	16	16	18	20	22	16	11	27	9	8	17	5	6	11
Senegal	0	0	0	0	0	1	0	1	1	0	1	0	0	0
Sierra Leone	0	0	0	0	0	0	1	1	0	1	1	0	0	0
South Africa	2	2	2	2	2	0	2	2	0	2	2	0	2	2
Sudan	0	1	2	2	3	2	0	2	4	1	5	2	0	2
Tanzania	0	0	0	0	0	0	0	0	1	0	1	1	0	1
Tunisia	4	6	7	8	11	8	3	11	5	2	7	5	1	6
Zaire	1	0	1	1	2	1	1	2	1	1	2	1	1	2
Subtotal	**173**	**175**	**200**	**219**	**212**	**155**	**54**	**209**	**107**	**43**	**150**	**73**	**33**	**106**
EUROPE														
Austria	10	9	10	8	9	9	0	9	9	0	9	7	0	7
Belgium	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Denmark	0	0	0	3	4	0	2	2	1	4	5	0	3	3
France	7	8	11	13	21	21	2	23	16	1	17	20	1	21
Germany	21	22	21	22	26	31	0	31	25	0	25	19	0	19
Greece	0	2	2	3	6	2	2	4	2	1	3	3	1	4
Holland	18	14	17	17	16	8	12	20	6	10	16	7	11	18
Ireland	2	3	2	1	0	1	1	2	0	2	2	1	1	2
Italy	12	18	21	19	31	31	7	38	19	7	26	20	6	26
Norway	5	5	7	11	12	0	13	13	0	10	10	0	10	10
Portugal	0	0	0	0	1	1	0	1	1	0	1	0	0	0
Spain	6	6	5	10	11	7	5	12	4	3	7	5	4	9
Switzerland	0	0	0	1	1	1	0	1	1	0	1	0	0	0
United Kingdom	36	34	34	48	58	2	55	57	2	40	42	6	54	60
Yugoslavia	24	23	22	22	22	24	0	24	20	2	22	23	2	25
Subtotal	**140**	**142**	**152**	**178**	**216**	**137**	**98**	**235**	**107**	**77**	**184**	**110**	**93**	**203**
MIDDLE EAST														
Abu Dhabi	15	16	20	23	30	18	23	41	12	23	35	9	20	29
Bahrain	0	2	1	1	1	1	0	1	1	1	2	0	0	0
Dubai	4	2	1	3	3	1	2	3	3	4	7	4	3	7
Egypt	20	16	21	26	26	14	22	36	16	19	35	15	21	36
Fujairah	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Iran	56	53	8	—	—	9	2	11	12	2	14	18	2	20
Iraq	27	29	32	39	14	11	0	11	23	0	23	19	0	19
Jordan	0	0	0	0	0	0	0	0	3	0	3	3	0	3
Kuwait	1	2	2	3	3	4	0	4	4	1	5	4	1	5
Oman	6	6	7	8	10	11	2	13	10	2	12	11	0	11
Qatar	6	6	6	8	8	3	2	5	1	2	3	1	1	2
Ra's al Khaymah	2	1	0	1	1	1	1	2	1	1	2	0	0	0
Saudi Arabia	21	22	22	25	29	16	14	30	14	12	26	10	6	16
Sharjah	2	1	0	1	3	2	1	3	1	0	1	0	0	0
Syria	18	17	15	15	16	15	0	15	15	0	15	23	0	23
Turkey	16	17	9	24	26	34	0	34	26	0	26	24	0	24
Umm al Qawain	1	1	0	0	1	1	0	1	1	0	1	0	0	0
Subtotal	**192**	**189**	**143**	**175**	**170**	**134**	**66**	**200**	**141**	**63**	**204**	**143**	**54**	**197**
SOUTH PACIFIC														
Australia	7	10	11	15	23	24	9	33	15	10	25	24	10	34
Fiji	0	0	0	0	0	1	0	1	0	0	0	0	0	0
New Zealand	1	2	2	2	3	1	1	2	2	2	4	1	1	2
Papua New Guinea	0	0	0	1	1	1	0	1	1	1	2	1	0	1
Subtotal	**8**	**12**	**13**	**18**	**26**	**26**	**9**	**35**	**17**	**11**	**28**	**26**	**11**	**37**
Total	**3,226**	**3,604**	**3,680**	**4,622**	**5,636**	**4,135**	**647**	**4,782**	**3,155**	**563**	**3,718**	**3,353**	**564**	**3,917**

Source: Hughes Tool Company

Note: Columns may not add to totals due to independent rounding.

World well completions—1983

	Total wildcats	Total footage	Oil	Gas	Total field wells	Oil	Gas	Footage
Middle East								
Abu Dhabi	25	322,685	—	—	—	—	—	—
Other UAE	9	128,186	1	1	—	—	—	—
Turkey	21	191,944	1	4	—	—	—	—
Oman	38	268,288	14	3	—	—	—	—
Israel	18	19,328m	2	—	—	—	—	—
Europe								
Austria	21	163,822	2	4	29	14	7	200,178
Denmark	1	—	—	—	—	—	—	—
France	28	258,713	4	0	105	72	4	521,933
Greece	5	60,695	—	—	3	3	0	29,829
Ireland	6	62,344	1	0	—	0	0	—
Italy	66	489,704	8	16	52	1	7	365,720
Netherlands	11	127,208	0	10	—	—	—	166,033
North Sea								
U.K.	117	1,325,180	27	27	119	55	9	NA
Norway	50	404,763	11	13	25	19	0	NA
Netherlands	38	380,110	1	6	21	8	10	NA
Denmark	12	130,438	2	—	17	0	17	NA
Germany	3	20,597	—	—	—	—	—	NA
Portugal	3	13,842	0	0	—	—	—	—
Spain	24	183,552	1	5	—	—	—	—
Sweden	15	15,948	6	0	—	—	—	—
U.K.	24	73,000	8	3	—	—	—	7,736
West Germany	41	410,702	10	6	38	0	0	245,203
Yugoslavia	63	324,750	17	5	130	34	14	666,040
South America								
Argentina	130	338,054m	26	9	—	—	—	—
Bolivia	9	33,642m	0	3	—	—	—	—
Brazil	262	64,000m	53	12	883	664	10	—
Chile	5	11,013m	5	0	—	—	—	—
Colombia	35	244,000ft.	13	0	—	—	—	—
Ecuador	10	92,000ft.	7	0	—	—	—	—
Peru	23	183,000ft.	5	3	—	—	—	—
Trinidad & Tobago	11	98,000ft.	4	0	—	—	—	—
Venezuela	19	246,000ft.	1	3	—	—	—	—
Mexico	65	—	11	6	—	—	—	—
North Africa								
Algeria	2	33,000ft.	—	—	30	—	—	—
Egypt	70	568,700ft.	26	5	66	—	—	677,103 ft.
Morocco	8	49,963ft.	0	0	1	—	—	29,610 ft.
Sudan	24	166,600ft.	10	0	0	—	—	—
Tunisia	14	131,500ft.	2	2	5	4	0	36,991 ft.

Other Africa	Total	Wildcat	Devel.	Footage	Other wells	Oil	Gas	Footage
Angola	35	18	17	268,773	18	4	0	159,779
Cabinda	45	4	41	229,718	4	3	0	31,561
Benin	4	0	4	31,048	—	—	—	—
Cameroon	73	4	69	431,061	4	1	1	28,667
Congo	35	4	31	220,921	4	1	0	51,358
Gabon	51	11	40	337,276	11	3	0	75,309
Ivory Coast	8	4	4	78,277	4	0	0	32,031
Niger	2	1	1	12,756	1	0	0	6,540
Nigeria	100	24	76	1,056,058	24	4	2	262,036
South Africa	14	11	3	150,158	11	0	2	121,206
Tanzania	3	1	2	21,340	1	0	0	7,150
Zaire	17	4	13	84,073	4	2	0	34,096
Australia	182	1,094,038ft.	—	—	106	—	—	762,953
New Zealand	15	42,523m	—	—	—	—	—	—
Papua-New Guinea	4	9,158m	—	—	—	—	—	—
Far East								
Bangladesh	1	—	—	—	1	—	—	—
Brunei	6	—	1	1	63	—	—	—
India	12		1	5	—	—	—	—
Indonesia	267	—	21	16	702	—	—	—
Japan	23	—	—	—	4	—	—	—
Malaysia-Sabah	5	—	—	—	2	—	—	—
Malaysia-Sarawak	6	—	—	—	22	—	—	—
Malaysia	9	—	—	—	65	—	—	—
Pakistan	14	—	2	—	17	—	—	—
Philippines	4	—	—	—	1	—	—	—
South Korea	1	—	—	—	0	—	—	—
Taiwan	18	—	—	1	—	—	—	—
Thailand	38	—	—	—	72	—	—	—

	Total	Oil	Gas	Dry et al.	Footage	Total wildcats	Oil	Gas	Dry	Footage
Canada	7,095	4,189	1,438	1,468	26,790,010	2,041	764	472	805	9,582,398
U.S.	78,542	37,207	15,628	25,707	330,822,930	13,890	2,093	1,389	9,908	72,219,356

Development wells	Oil	Dry
Cameroon	66	7
Congo	28	0
Gabon	27	3
Nigeria	64	12

Sources: AAPG, API.

Gas production (billions cu ft)

	1984
WESTERN HEMISPHERE	
Argentina	653.2
Bolivia	89.7
Brazil	173.2
Canada	2,651.8
Chile	179.8
Colombia	188.7
Ecuador	16.8
Guatemala	1.2
Mexico	1,373.3
Peru	44.4
Trinidad	121.9
United States	18,068.0
Venezuela	609.6
Total	**24,171.6**
EUROPE	
Austria	45.3
Denmark	18.0
France	373.4
West Germany	648.2
Greece	1.7
Italy	638.9
Netherlands	2,677.5
Norway	922.6
Turkey	39.7
Spain	6.8
United Kingdom	1,423.3
Total	**6,795.4**
MIDDLE EAST	
Bahrain	194.3
Iran	360.0
Iraq	18.0
Israel	2.4
Kuwait	144.0
Oman	146.3
Qatar	156.0
Saudi Arabia	240.0
Syria	8.4
United Arab Emirates	264.0
Total	**1,533.4**
ASIA-PACIFIC	
Afghanistan	102.0
Australia	444.4
Burma	16.8
Brunei	312.0
India	102.0
Indonesia	732.0
Japan	73.5
New Zealand	135.1
Malaysia	120.0
Pakistan	355.2
Taiwan	60.0
Thailand	77.7
Total	**2,530.7**
AFRICA	
Algeria	1,260.0
Angola	12.0
Congo	0.7
Egypt	108.0
Gabon	4.8
Ivory Coast	—
Libya	150.0
Morocco	3.6
Nigeria	72.0
Tunisia	18.0
Total	**1,629.1**
COMMUNIST	
China	420.0
Romania	1,240.0
USSR	20,240.0
Other	891.0.0
Total	**23,272.1**
WORLD TOTAL	**59,932.3**

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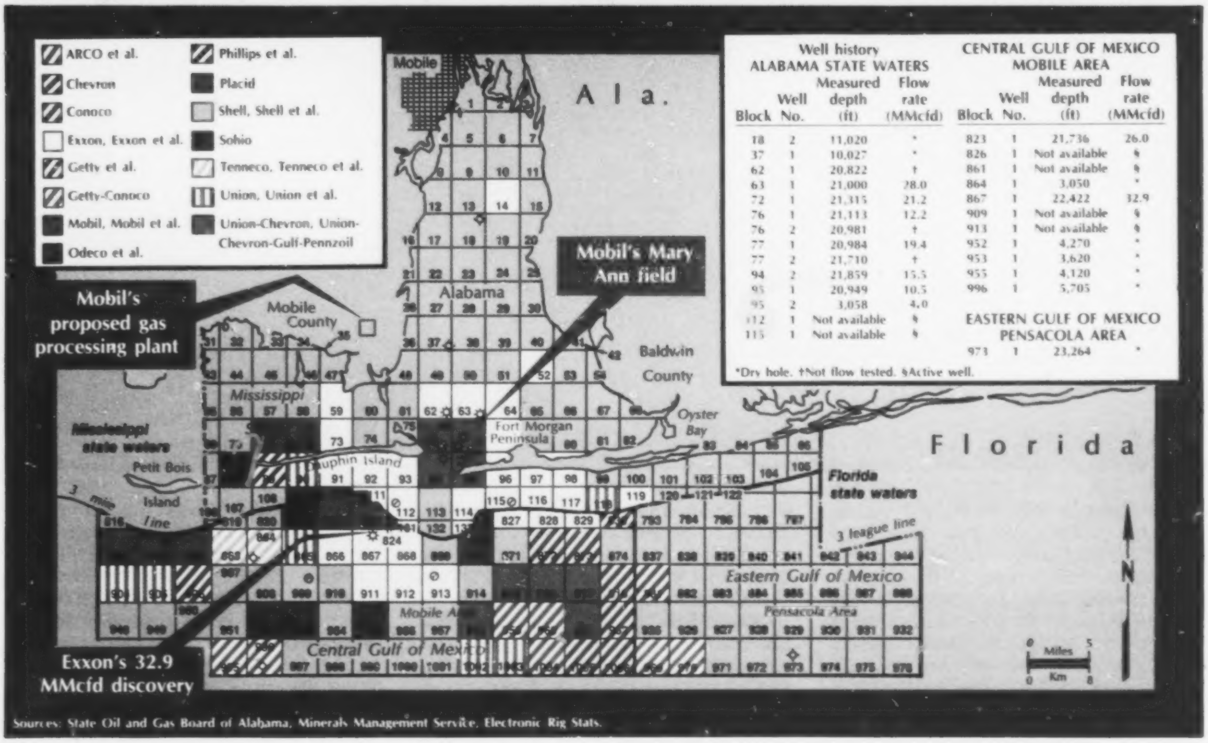
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Conoco
Exxon, Exxon et al.
Getty et al.
Getty-Conoco
Mobil, Mobil et al.
Odeco et al.
Phillips et al.
Placid
Shell, Shell et al.
Sohio
Tenneco, Tenneco et al.
Union, Union et al.
Union-Chevron, Union-Chevron-Gulf-Pennzoil
Mobile
Ala.
Alabama
Mobile County
Baldwin County
Mississippi
Mississippi state waters
Petit Bois Island
3 mile line
Dauphin Island
Fort Morgan Peninsula
Oyster Bay
Florida
Florida state waters
3 league line
Eastern Gulf of Mexico
Pensacola Area
Mobile Area
Central Gulf of Mexico
Miles
Km
N

Mobil's proposed gas processing plant

Mobil's Mary Ann field

Exxon's 32.9 MMcfd discovery

Well history

ALABAMA STATE WATERS

Block	Well No.	Measured depth (ft)	Flow rate (MMcfd)
18	2	11,020	*
37	1	10,027	*
62	1	20,822	†
63	1	21,000	28.0
72	1	21,315	21.2
76	1	21,113	12.2
76	2	20,981	†
77	1	20,984	19.4
77	2	21,710	†
94	2	21,859	15.5
95	1	20,949	10.5
95	2	3,058	4.0
112	1	Not available	§
115	1	Not available	§

CENTRAL GULF OF MEXICO
MOBILE AREA

Block	Well No.	Measured depth (ft)	Flow rate (MMcfd)
823	1	21,736	26.0
826	1	Not available	§
861	1	Not available	§
864	1	3,050	*
867	1	22,422	32.9
909	1	Not available	§
913	1	Not available	§
952	1	4,270	*
953	1	3,620	*
955	1	4,120	*
996	1	5,705	*

EASTERN GULF OF MEXICO
PENSACOLA AREA

Block	Well No.	Measured depth (ft)	Flow rate (MMcfd)
973	1	23,264	*

*Dry hole. †Not flow tested. §Active well.

Sources: State Oil and Gas Board of Alabama, Minerals Management Service, Electronic Rig Stats.

the most significant increase in 1984. That class of rigs topped the 90% mark in December with a 91.8% worldwide utilization level.

The 440 jack-ups in the worldwide fleet reached a utilization mark of 87.5% as '84 drew to a close as compared to the 78.3% rate for that class of rig at the end of 1983. Demand for the larger jackup remained strong in the Gulf with a 91.4% usage rate in December as compared to the dismal 76.5% rate seen on Dec.7, 1983.

Increased utilization notwithstanding, most rigs operating in U.S. and international waters continue to receive day rates that are below market value. In 1984, however, positive signs were beginning to point to what could develop into a significant rise in charter fees during 1985.

In January 1984 a 250-ft. or less cantilever jackup was attracting $9,000 to $10,000 a day as compared to the $30,000 to $40,000 rate this class of rig was attracting during the 1980 and 1981 boom. By year-end the rate for that rig had rose to $12,000 to $14,000 a day, which represents a 35% increase.

With the heightened emphasis on deepwater exploration, the rates for semisubmersibles were beginning at the end of 1984 to rise much faster than that for jackups. Longer term contracts also were beginning to be realized as operators move to lock down commitments for their 1985 drilling programs. Between 1983 and '84 the day rates for semis remained in the $25,000 range, but increases are expected in the new year.

Significant increases also are being enjoyed for the hostile environment class of jackup. A North Sea jackup was dayrated at $20,000 in January 1984, but by the end of the year the rates were varying at between $18,000 to $37,000. The much ballyhoed jackup Gorilla, for instance, was receiving $35,000 a day at the end of 1983 and a year later that same rig was garnering $45,000 daily.

The bullish outlook of operators on the future of the offshore market is perhaps best reflected in the rig construction sector. During 1984 a total of 38 mobile offshore drilling units were under construction, representing an increase of one rig over the 1983 tally. A breakdown at the end of 1984 showed three drillships, 22 semisubmersibles and 13 jackups under construction.

Undoubtedly the most promising order placed during 1984 was the $425 million contract inked by Sonat Inc. for the construction of six semi-submersibles. South Korea's Daewoo Corp. and its Daewoo Shipbuilding & Heavy Machinery Ltd. subsidiary will build the rigs based upon a design by Gotaverken Arendal AB of Goteborg, Sweden.

Table 1

Worldwide Rig Utilization as of December 1984

Class	Drill	En Route	Idle	Stack	Mode	Total	%	%/83
DB	20	0	7	4	0	31	87.1	86.7
DS	33	4	8	10	0	55	81.8	57.9
JU	362	1	14	56	7	440	87.3	78.3
SEMI	127	4	15	14	10	170	91.8	81.6
SUB	19	0	1	8	0	28	71.4	69.0
Total	**561**	**6**	**45**	**92**	**17**	**724**	**87.3**	
1983	**495**	**19**	**24**	**158**		**696**		**77.3**

Table 2

Gulf of Mexico Rig Utilization as of December 1984

Class	Drill	En Route	Idle	Stack	Mode	Total	%	%/83
DB	0	0	0	0	0	0	0	0
DS	6	1	1	2	0	10	80.0	50.0
JU	156	0	1	16	2	175	90.8	77.0
SEMI	29	0	2	5	0	36	86.1	70.4
SUB	19	0	1	7	0	27	74.1	74.1
Total	**210**	**1**	**5**	**30**	**2**	**248**	**87.9**	
1983	**162**	**3**	**3**	**55**		**223**		**75.3**

the construction phase.

Southeast Asia tops the construction tally with 85 projects in various stages of development, up substantially from the 69 under construction a year earlier. The North Sea came in second with 75 platform projects under construction, representing a decline from the 77 units being built in 1983.

A major jump was seen in the Gulf of Mexico were 63 platforms were under construction in '84 as compared to 50 in the previous year. A decline, however, is seen in the Middle East where 46 projects are on the boards, down from the 69 platforms either planned or in fabrication in the year before.

The remaining areas reporting platform activity in 1984 include Latin America/Caribbean, 18; West Africa, 12; U.S. West Coast, 12 and the Mediterranean area, 10.

Platform activity offshore California, despite the rampant environmental problems, also is threatening to take a significant leap in 1985 and beyond. A total of 15 new platforms are planned off California for development of existing fields. A California breakdown shows six planned for the Santa Maria Basin, eight for the Santa Barbara Channel and one for the Los Angeles Basin.

At years-end a total of 25 platforms already were in place offshore California with 19 being located in the Santa Barbara Channel and the remaining six units producing in Southern California. Additionally, Califoria waters house six manmade islands that serve as production operation bases.

A number of significant new developments unfolded on the platform scene last year with the two most noteworthy projects taking place in the deepwater Gulf of Mexico and in the North Sea.

The industry is keeping a close watch on the development of Shell Offshore's Green Canyon Block 65 discovery which sits in 1,350 ft of water. Shell's planned Bullwinkle platform would rest on a 55,000-ton piled steel jacket. While still under study at the end of 1983, the platform is tentatively scheduled to come on stream by 1988.

In the North Sea, McDermott Scotland received a $85 million contract to build a 18,000 metric ton jacket and two 4,500 metric ton compression modules for Marathon Oil's Brae B platform. The 365-ft tall K-braced structure will support the first gas cycling development in the North Sea. The platform is scheduled to begin production during 1987 or 1988.

The platform project garnering the most interest in 1984, however, was the celebrated Conoco Tension Leg Platform, which at year-end was producing 90,000 b/d of oil in the Hutton field of the North Sea. The revolutionary TLP was routinely installed in the summer of '84 and has performed nearly flawlessly ever since.

Conoco also may utilize the TLP technology elsewhere as the company at the close of 1984 was toying with the idea of using a similar design on its Gulf of Mexico deepwater Green Canyon Block 184 discovery.

The marine construction industry entered 1985 entertaining thoughts that it could be headed into one of its best years ever and facing a serious challenge to improve lifting capabilities.

A trend toward heavier lifts in northwest Europe already is apparent as marine fabricators rush to meet the ever-increasing platform construction market. Activity is particularly strong in the U.K. and Dutch sectors of the North Sea where tax relief has spurred exploration and development activity.

As explorationists move further into the northern North Sea, heavy lifts appear to be the solution to overcoming a very limited weather window. To widen the windows contractors have for sometime transferred cranes from barges to shipshape vessels and eventually to semisubmersibles. This has led to the evolution of the supersemisubmersible that for all practical purposes has eliminated the problems associated with the weather window.

The new generation of large semisubmersible construction vessels, or SSCV, are designed to lift heavier modules and extend the weather window by being able to remain on location longer.

Besides the North Sea, these units also can be used for construction projects off the east coast of Canada and along the African west coast where ocean swells pose a frequent problem for offshore installations.

A couple of years ago the slump in the marine transportation sector was depicted by too much equipment vying for too few jobs. No one is predicting a bonanza in the transportation segement in the coming year, but at least supply and demand are beginning to near some semblance of equilibrium.

Some areas, particularly the larger specially-built work boats, were even facing a shortage situation as 1984 wound down. Companies also have launched full-scale retirement programs for older boats that a few years ago had to remain in the fleets to handle the large volume of business.

Supply and service boats will continue in the near-term to work for lower rates, but bright spots are beginning to unfold. The Gulf of Mexico and the North Sea naturally will continue to be the prime employment opportunity centers, but other regions also are opening more jobs for the boat operators.

A couple of areas predicting a major jump in boat assignments are in the Southeast Asia offshore sectors. Increased activity in the South China Sea is expected to spill over into the boat segement of the industry. india likewise will experience increased demand as offshore projects are expected to require the services of at least 50 boats in early 1985. At the end of '84 an estimated 34 service boats were handling Indian offshore installations.

In the interim, boat operators are turning more toward modifying their existing fleets rather than adding newer equipment. The primary challenge is in designing specialty built boats and modify-

Worldwide offshore daily average oil production (000 b/d)

AREA/Country	1979	1980	1981	1982	1983	1982-1983 Change	% Change
MIDDLE EAST							
Saudi Arabia	2,828.00	2,958.00	3,000.00	2,392.00	2,100.00§	-292	12
Egypt	430.00	390.31	570.00	570.00	508.65	- 61	11
Dubai	362.73	344.95	359.00	364.00	323.00	-41	11
Abu Dhabi	596.83	1,322.01	555.00	443.40	338.46	-105	24
Divided Zone	395.20	403.00	268.00	158.00	216.00	+ 58	37
Qatar	275.73	247.55	192.69	167.49	129.20	- 38	23
Iran	200.00 +	150.00 +	350.00	—	—	—	
Sarjah	12.08	10.00	10.50	6.92	6.94	+ —	
Total	**5,064.57**	**5,825.82**	**5,305.19**	**4,101.81**	**3,622.25**	**-479**	**11.4**
LATIN AMERICA/CARIBBEAN							
Mexico	430.00	500.23	1,105.96	1,638.63	1,673.83	+ 35	2
Venezuela	1,050.00	1,095.58	1,043.58	1,026.12	1,128.24	+102	10
Brazil	72.00	73.00	91.83	176.90	197.17	+ 20	11
Trinidad/Tobago	167.44	166.51	154.00	135.16	123.28	- 12	9
Chile	—	—	—	31.26	29.51	- 2	5
Peru	29.14	29.86	26.00	26.56	25.21	- 1	5
Total	**1,748.58**	**1,865.18**	**2,421.37**	**3,034.63**	**3,177.24**	**+142**	**4.6**
NORTH SEA							
United Kingdom	1,571.40	1,650.00	1,800.00	2,060.00	2,270.94	+211	10
Norway	407.34	628.81	509.00	534.26	615.00	+ 81	15
Denmark	12.00	6.63	15.00	34.00	43.00	+ 9	26
Netherlands	—	—	—	—	20.83		
Total	**1,990.74**	**2,285.44**	**2,324.00**	**2,628.26**	**2,949.77**	**+321**	**12.2**
NORTH AMERICA							
United States	**1,066.00**	**1,038.09**	**1,064.00**	**1,110.00**	**1,258.00**	**+148**	**13.3**
SOUTHEAST ASIA/FAR EAST							
Indonesia	374.66	533.05	561.00	535.69	438.45	- 97	18
Malaysia	271.03	280.32	250.00	302.20	383.00	+ 81	29
India	81.36	142.14	160.00	257.00	342.33	+ 85	33
Australia	401.00	323.21	348.14	368.08	341.07	- 27	7
Brunei	189.61	192.24	126.00	121.01	121.60		
Philippines	26.00	4.00	7.80	16.50	14.70	- 2	11
Thailand	—	—	—	6.03	6.81	+	
New Zealand	—	3.16	4.50	8.74	6.70	- 2	23
Japan	0.50	1.53	0.88	0.86	0.99	+	
China	2.00	2.00	2.00	—	—		
Total	**1,345.16**	**1,481.65**	**1,460.32**	**1,616.11**	**1,655.65**	**+ 39.54**	**2.4**
WEST AFRICA							
Nigeria	543.52	579.05	455.00	371.44	306.08	- 65	18
Gabon	196.00	177.90	113.44	102.52	130.02	+ 28	27
Angola/Cabina	160.00	96.96	134.00	87.65	142.45	+ 55	63
Congo	52.00	27.00	79.00	86.66	94.85	+ 8	9
Cameroon	—	—	—	103.58	93.40	- 10	9
Zaire	20.84	21.51	19.00	21.49	21.32	-	
Ivory Coast	—	5.80	9.80	9.37	21.25	+ 12	27
Ghana	2.00	2.00	1.80	1.30	1.20	—	
Total	**974.36**	**910.22**	**812.04**	**784.01**	**810.57**	**+ 26**	**3.4**
SOVIET UNION							
USSR	**190.00*†**	**200.00**	**196.00§**	**177.00**	**175.00§**	**- 2**	**1.1**
MEDITERRANEAN							
Spain	22.18	31.25	21.79	28.37	57.80	+ 29	3
Tunisia	48.50	43.57	34.00	30.53	39.16	+ 9	28
Greece	—	—	—	20.92	23.00	+ 2	10
Italy	4.84	6.27	6.04	10.01	22.60	+ 13	1
Total	**75.52**	**81.09**	**61.83**	**89.83**	**142.56**	**+ 53**	**58.1**
TOTALS	**12,491.93†**	**13,687.49**	**13,664.61**	**13,541.25**	**13,791.04**	**+249**	**+ 1.8%**
WORLD TOTAL	**62,768.00**	**59,812.00**	**55,886.20**	**53,191.00**	**53,259.00**	**+ 68**	**+ 0.1%**
% OFFSHORE	**20.15**	**22.88**	**24.45**	**25.46**	**26.69**	**+1.23**	

§Estimate *Crude and condensate †Revised figures

International Offshore Well Count

Area Country	1979	1980	1981	1982	1983	1984 (forecast)
Abu Dhabi	71	85	74	89	110	124
Angola/Cabinda	7	2	21	58	74	70
Argentina	2	5	9	10	9	5
Australia	30	24	26	57	54	58
Brazil	148	139	121	148	181	191
Brunei	57	30	26	55	39	45
Cameroon	15	15	40	68	60	45
Canada	17	14	21	21	30	35
Chile	34	28	63	59	63	68
China, PRC	15	15	9	17	30	55
China, Taiwan	6	11	6	2	5	4
Colombia	13	3	1	2	5	5
Congo	14	2	41	73	65	53
Denmark	2	0	12	22	29	27
Dubai	2	3	13	29	29	33
Ecuador	0	7	1	2	3	4
Egypt	37	30	83	84	133	128
France	4	3	7	4	3	5
Gabon	29	27	45	50	48	42
Germany (West)	3	3	5	9	4	11
Ghana	2	2	3	1	2	2
Greece	6	6	9	11	0	4
India	23	34	37	54	81	100
Indonesia	116	75	204	261	315	289
Iran	3	3	2	5	5	10
Iraq	0	1	0	NA	NA	0
Ireland	16	3	8	3	6	9
Italy	36	34	44	62	51	45
Ivory Coast	1	9	18	26	7	6
Japan	5	7	7	10	7	4
Kenya	1	0	1	0	0	0
Libya	4	5	6	5	6	8
Malaysia	73	17	86	110	108	92
Malta	0	1	0	2	2	2
Mexico	15	47	46	53	24	62
Morocco	2	0	1	1	2	2
Netherlands	30	38	40	65	58	81
Netherlands Anitlies	0	0	0	1	0	0
New Zealand	2	0	4	0	2	2
Nigeria	25	53	46	89	47	63
Norway	28	36	39	80	62	90
Oman	2	0	0	2	1	2
Peru	49	50	59	75	66	101
Philippines	23	12	15	11	1	1
Portugal	2	0	1	1	0	0
Qatar	10	3	18	15	8	15
Saudi Arabia	30	37	46	84	82	126
Sierra Leone	0	0	0	1	0	0
South Africa	8	9	15	10	14	16
South Korea	0	2	1	0	0	0
Spain	17	16	19	21	16	12
Sri Lanka	0	0	2	0	0	0
Sudan	1	1	2	1	1	2
Tanzania	0	0	2	4	2	1
Thailand	0	24	26	41	96	100
Trinidad/Tobago	67	46	54	44	42	37
Tunisia	16	12	15	17	12	12
Turkey	0	0	2	0	0	0
United Kingdom	151	176	209	235	223	245
United States	1,063	961	1,075	1,126	1,343	1,155
USSR	92	85	87	85	87	89
Venezuela**	16	14	12	17	17	8
Vietnam	8	3	0	0	0	0
Zaire	0	3	4	6	6	5
Totals	**2,452 †**	**2,274**	**2,889**	**3,494**	**3,776**	**3,806**

NA-information not available **Does not include Lake Maracaibo †Includes 2 wells offshore Yemen.

the 128 total wells drilled for all of 1983. A total of 140 wells, of which 82 were wildcats, had been sunk in the U.K. sector as of the last of September 1984, according to Alick Buchanan-Smith, minister of state for energy.

Overall, a survey of North Sea operators revealed more than $9 billion will be spent on developing fields in the entire region over the rest of the decade. Exploration activity is likewise expected to increase as tax relief measures enacted in 1983 by the U.K. affords operators the luxury of exploring potentially marginal fields.

Norway also is expecting an increase in exploration in 1985 and in the years after.

The Norwegian sector of the North Sea saw an estimated 100 exploration and development wells completed in 1984, which represents an increase over the 82 completed in the Norwegian sector during 1983.

The only remaining North Sea nation forseeing major activity is Denmark. Following its first round of licensing, the Danish sector of the North Sea is expected to see an increase in drilling and development activity.

Latin America. Exploration numbers for offshore Mexico were down in 1984 with the primary reasons being the massive Mexican debt and dropping oil prices. Activity may increase in the near-term as the nation attempts to maintain its short-term development program.

Brazil will continue to be the primary player in the Latin American region. Exploration levels, however, will continue to be down slightly because of the limited budget of its state-company Petrobras. Development activity on the other hand will remain strong as the nation desires to expand production of newly discovered fields.

Interest in Brazil traditionally has focused on the prolific Campos Basin. In December 1984 attention moved to the fringes of the basin where Petrobras announced a major oil discovery off the coast of Rio de Janeiro.

The new field has been estimated to contain between 200 million and 250 million bbl, which classifies the field as the second largest in the nation's history. This strike extend the known scope of the Campos Basin beyond the 600-ft. water depth line.

Elsewhere, Argentina will see a slightly increased level of exploration in 1985 as the promising Shell drilling program gets underway. Argentina predominately is involved in onshore projects, but should move heavier into the offshore arena in 1985 and beyond.

Venezuela, one of the continent's largest producer and a member of OPEC, will see a decline in development activity as the nation follows production constraints handed down by the cartel. Exploration activity is expected to be flat-to-up in the near term future.

Some increase in activity also is forecast for the relatively virgin Caribbean region.

Asia/Pacific. China, specifically the South China Sea, continues to be in the spotlight of the Asia oil industry. A promising oil discovery by Esso China and the opening of new acreage for exploration promises to increase wildcat activity along the Chinese coastline.

How offshore producers balance shapes up

	1970 (In 000 b/d)	1975	1980	1985 (Est.)
Producers of more oil				
United Kingdom	—	83	1,650	2,497
Mexico	35	45	500	1,857
United States	1.5	909	1,038	1,385
Norway	—	189	628	676
Total				**6,415**
and those taking up the slack				
Saudi Arabia	1,251	1,385	2,958	2,100
Dubai	70	249	344	323
Abu Dhabi	269	462	1,322	338
Divided Zone	310	315	403	216
Venezuela	2,460	1,737	1,095	1,240
Total				**4,217**
As comparison				
Total offshore	7.532	8,264	13,687	15,308
World demand	46,440	55,720	61,600	51,500

An estimated 40 to 50 wells are expected to be sunk in the South China Sea during 1985, according to Dr. Kim Woodard, president of Washington D.C.-based China Energy Ventures.

Ten rigs were operating offshore China as of December 1984 and more were scheduled to begin turning to the right early in 1985.

Indian remains one of Asia's most active offshore markets. At year end the nation was producing about 60% of its domestic oil consumption with the majority being pumped from the Bombay High offshore field.

As per its desire to be energy self-sufficient, India intends to spend as much as $28 billion between 1985 and 1990. That expenditure is expected to add more than 100 new land rigs and 30 offshore rigs to its domestic drilling fleet.

Indonesia, Asia's only OPEC member, probably will see a decline in production offshore, but should maintain exploration levels. Indonesia has the most mature oil industry of the countries in this region, producing an estimated 1.5 million b/d of oil as of December 1984

In the Pacific, cash bonus bidding for premium Bass Strait acreage began in December, which could adversely affect exploration levels offshore Australia.

These new bidding terms, disappointing results in the Jabiru field and implementation of the Resources Rental Tax are expected to reduce exploration activity in 1985.

Africa. The only significant development offshore Africa has been the move to the East Coast of the continent.

During 1984 Amoco and British Petroleum announced drilling programs in the untouched waters off Mozambique. Tanzania also is expected to draw the attention of drillers in 1985.

Egypt, meanhile, remains one of the continent's only nations to maintain a strong exploration program, much of which is concentrated in the Gulf of Suez.

Mediterranean. As a whole, exploration activity is declining throughout this region. Slight increases are expected in many nations in the coming years, however.

Libya continues to lead the way in activity and at year-end was beginning development of the region's biggest field, Bouri. Agip plans to drill 30 development wells in the field from the first phase platform.

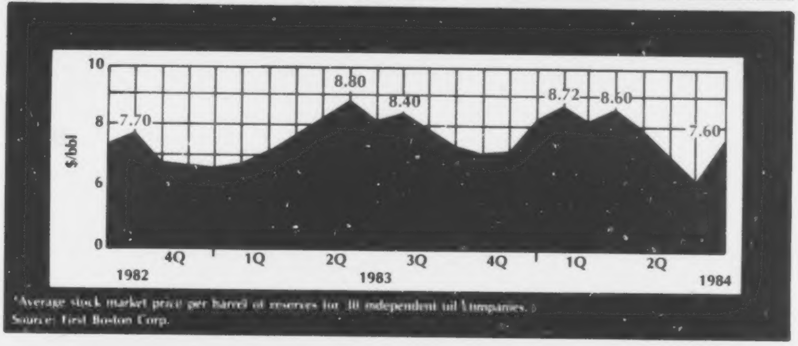
Tunisia plans to drill an estimated 19 exploration and development wells between 1984 and 1985.

Drilling held steady in Spain during 1984 and not much change is expected for 1985. Agip, meanwhile, plans to drill 21 wildcats offshore Italy next year while Elf and Montedison also expect increased activity offshore Italy.

Middle East. Sluggish perhaps would represent the best description of 1984 offshore activity in this war-torn region. Also, production cutbacks by OPEC indicate activity will continue to decline slowly. Because it is easier to produce onshore fields, the offshore forecast is gloomy for the near future. The Iran-Iraq war also posed a barrier to operators in the Arabian Gulf during 1984.

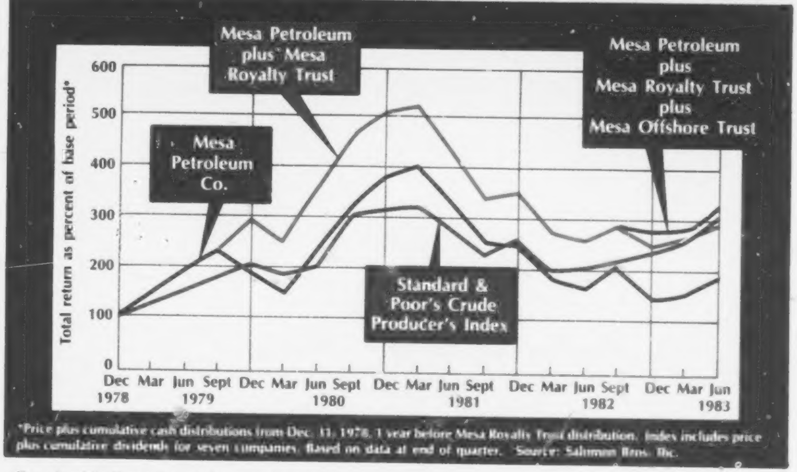
The problems notwithstanding, offshore rig activity has remained remarkably stable. In the final quarter of 1984, the Middle East had maintained a constant offshore tally of 60 rigs. This total, however, did represent a substantial drop from the 76 making hole in 1983. IPE

How reserves values stagnated in stock market*



*Average stock market price per barrel of reserves for 30 independent oil companies.
Source: First Boston Corp.

Mesa's stock market performance with royalty trusts



*Price plus cumulative cash distributions from Dec. 31, 1978, 1 year before Mesa Royalty Trust distribution. Index includes price plus cumulative dividends for seven companies. Based on data at end of quarter. Source: Salomon Bros. Inc.

clined with the slump in crude oil prices that got into full swing early in 1983.

And some oil company analysts pointed out that the "buy vs. drill" question was an oversimplification, anyway. They said a comparison between costs (or assessed values) and implied market values didn't account for other drilling incentives.

The momentum was behind the merger trend, nevertheless, pushed along in great measure by issues of management and shareholder values raised by Mesa's Pickens.

In his drive for Gulf, for example, he insisted that shareholders would gain more through his plan to spin off and liquidate a great portion of Gulf's U.S. producing properties than they would if they held onto their shares.

Pickens found a ready audience in institutional investors, which owned huge blocks of target firm stocks and which, bound by fiduciary laws, often felt obligated to side with the deal that offered the earliest, surest profits.

The merger spree, therefore, became a competition among perceptions of value.

Citing the takeovers of Conoco Inc. (by DuPont Co.), Cities Service, and Marathon Oil Co. (by U.S. Steel Corp.), Spriggs said:

"The saga of these companies demonstrated that once forces are unleashed to realize the oil and gas values, there ensues an inexorable, virtually inevitable evolution of moves which lead to the transfer of assets to new hands at higher prices than the stock market accorded the companies as going concerns."

The restructuring angle. During all of his corporate raids, Pickens spoke of the restructuring of the U.S. oil industry.

This restructuring, he said, resulted from two forces: shareholder discontent and failure by big oil companies to replace oil and gas reserves as they produced them.

Pickens often faulted company managers that don't take big positions in their companies' stock. "They do not have the same interests as shareholders," he told a Cambridge Energy Research Associates conference.

"Caretaker managements are more concerned with job security, perks, and power than with shareholder interests. This kind of attitude is becoming increasingly unacceptable to shareholders."

Pickens told the same conference that if a company continuously fails to replace its reserves, "the company is being liquidated to the detriment of the shareholder."

Major oil companies, Pickens said, have more cash than good exploration prospects and "no real hope of replacing reserves other than by acquisition."

The pessimism about majors' exploration prospects was a central issue in the Mesa raid on Gulf. The target firm was emerging from a long period of slow earnings growth and had embarked upon an agressive campaign of frontier exploration.

Pickens was openly critical of the frontier exploration strategy, saying he saw no benefit to shareholders of searching for big reserves in remote, hostile areas when crude oil prices were stagnant at about $29/bbl.

Royalty trusts. The Mesa chief's answer to his perceived need for oil company restructuring, at least during the Gulf raid, was the royalty trust.

Several royalty trusts, in addition to two set up by Mesa, were in existence at the time of the Gulf-Mesa struggle. Most involved overriding royalty or net profits interests carved out of a company's working interests in specific properties.

The interests were transferred to independently administered trusts, units of which were distributed to company shareholders and traded like shares of stock.

Pickens proposed that Gulf spin off a 50% net profits interest in its U.S. proved reserves plus a 5% override in unproved properties.

Pickens and other royalty trust proponents saw several advantages to shareholders in such spin-offs. For one thing, trust units, at least theoretically, should trade at prices more closely reflecting underlying reserves values than stock of the company before spinoff. That would especially be so for companies with many unprofitable nonproducing assets.

And royalty trusts offered tax advantages. The biggest of these was that production proceeds in a trust weren't subject to corporate taxes. Shareholders thus weren't subject to "double taxation" of corporate profits—corporate taxes in conjuction with personal income taxes.

Royalty trust opponents, however, said tax advantages were overstated. They pointed out that corporate taxes were light burdens for most shareholders.

They also said that by diverting company profits to a trust, royalty trusts output....

"Today, although we still consider concentration and market shares to be important, they represent only the beginning—not the end— of our competitive analysis."

Other market characteristics to be analyzed, Miller said, include effects of foreign competition, barriers to entry (such as import controls or other government regulations), demand and supply responsiveness, and possible efficiencies.

Restructuring eyed. The administration, as well as a majority in Congress, refrained from reacting solely to the unprecedented size of the mergers of 1984.

"The commission," Miller said, "has no authority to challenge mergers just because they are large in physical terms or involve a great deal of money.

"The commission can take issue with a merger only if the effect may be 'substantially to lessen competition or tend to create a monopoly.' " The chairman's quote was from the Clayton Act, a key U.S. antitrust law.

And FTC generally accepted the view that industry mergers were symptoms of a basic restructuring.

"It is not a trend toward substantially higher concentration of control of our crude oil reserves or any accretion of market power," Miller said.

"Instead, it is a trend toward higher levels of uncertainty about the industry's future and confusion about the role of antitrust agencies in making sure the industry remains competitive."

A parallel view came from the majority staff on the Senate committee on energy and natural resources. The report came as several bills surfaced in the House and Senate attempting to cool merger activity.

The report stated that the oil industry was undergoing a restructuring and that mergers were a part of the process.

"If mergers were prohibited by legislative action, it is evident that the restructuring of the oil industry would continue to occur by other means."

The report cited these potential benefits of mergers: increased operating efficiencies, increased revenues available for exploration and development, and acquisition of certain divested assets by smaller oil companies.

Responding to some of the points of opposition to oil firm mergers, the report said mergers approved by FTC hadn't threatened competition.

"With relatively large numbers of competing companies in the production segment of the industry, mergers have not resulted in significant reductions in competition in that portion of the industry, and they have not resulted in lower levels of oil exploration and development," it said.

And mergers didn't hurt credit markets, as some had claimed, the report said.

Industry's biggest mergers

Company/acquirer	Amount Billion $	Date announced
Gulf/Chevron	13.2	March 5, 1984
Getty/Texaco	10.1	Jan. 6, 1984
Conoco/DuPont	7.4	July 6, 1981
Marathon/U.S. Steel	6.5	Nov. 19, 1981
Mobil/Superior	5.7	March 11, 1984
Texasgulf/Elf Aquitaine	4.2	June 26, 1981
Cities Service/Occidental	4.0	Aug. 13, 1982
Belridge/Shell	3.6	Sept. 30, 1979

How companies can resist takeover attempts

Make company less attractive	• Increase debt • Write down assets • Bid for another company • Give executives "golden parachutes" • Issue dilutive or sacrificial stock ("poison pill")
Discourage shareholder sales by enhancing stock values	• Stagger director terms • Toughen takeover conditions in corporate charter • Prohibit shareholder actions by written consent • Enter heavily regulated business to complicate merger
Make company difficult to acquire	• Buy own stock • Sell assets unrelated to core businesses • Increase dividends
Attack bidding company	• Sue • Bid for raider's stock

"A merger consists of an exchange of assets; consequently, it does not create a net increase in the demand for credit, and it does not withhold credit from competing borrowers.

"Moreover, because of the size of the U.S. capital markets and overall financial system, no single transaction is large enough to cause any significant disruption in the credit markets."

The report concluded that no antimerger legislation was called for, and none was passed. Congress did, however, amend tax laws regarding royalty trusts in its 1984 tax bill. The changes, relating to distribution of spun off assets, were thought to discourage formation of royalty trusts to a degree.

A close look. So what happened when the big firms merged?

The answer, of course, varied from merger to merger.

Among the five biggest mergers, two were takeovers of oil firms by companies involved in other businesses. They were U.S. Steel's purchase of Marathon and DuPont's purchase of Conoco.

In both those cases the acquired oil firms were left mostly intact to operate as subsidiaries of the acquiring companies.

The other three deals were more complicated. Here's a look at them.

Chevron/Gulf. Like most of the big takeovers, the Chevron/Gulf merger left the surviving company with huge debts that became a first order of business.

Chevron borrowed $10 billion to buy Gulf and immediately made plans to cut that burden in half within 5 years. To do so, it planned to sell $4-5 billion in Gulf assets, including some not involved in

A look at U.S. finding costs*

Company	1978-81	1981	1982
		$/bbl	
Shell	7.28	11.91	7.30
Union	7.39	12.23	11.30
Sun	9.43	10.02	10.50
Tenneco	9.61	12.81	11.20
Amoco	9.89	14.42	11.60
Texaco	10.01	21.33	16.50
ARCO	11.38	13.26	18.20
Chevron	11.43	20.23	17.70
Cities Service	12.27	25.65	23.30
Mobil	12.94	13.09	17.60
Exxon	12.95	11.22	15.40
Gulf	13.38	23.65	13.50
Phillips	15.99	33.03	10.70
Amerada Hess	16.26	8.64	16.00
Average	**11.25**	**15.31**	**14.34**

*Average capital cost of reserves added.
Source: First Boston Corp. from [illegible] Inc. data

divestitures required by FTC.

The balance of the debt reduction was to come from sale of Chevron assets.

The first Gulf property to be sold was Gulf Oil Trading Co. assets, purchasers of which were to be a group headed by the president of the subsidiary.

Chevron about doubled its worldwide hydrocarbon reserves in the deal. At yearend 1983 it reported worldwide reserves of 1.6 billion bbl of liquids and 6.7 trillion cu ft of gas. Its U.S. reserves totaled 1.2 billion bbl of liquids and 4.9 trillion cu ft of gas.

Gulf's 1983 worldwide reserves totaled 2 billion bbl of liquids and 5.7 trillion cu ft of gas. U.S reserves were 791 billion bbl of liquids and 3.8 trillion cu ft of gas.

Chevron announced preliminary merger plans in November.

It planned to move about 2,700 Gulf employees involved in accounting and computer work in Houston, Pittsburgh, and Atlanta to San Francisco.

Gulf's Pittsburgh headquarters were to be phased out. The firm's research activities at Harmarville, near Pittsburgh, were to be merged with Chevron's research functions around San Francisco. That involved about 900 workers.

About 3,000 Gulf jobs in Houston and 7,000 elsewhere in Texas were to remain in place. Most of the Chevron and Gulf exploration, land, and production offices open at the time of the merger were to remain in place.

Chevron planned to set up four regional headquarters for U.S. exploration, land, and production at Houston, New Orleans, Denver, and Concord, Calif.

It planned to move Gulf Oil Products Co. marketing and manufacturing activities from Houston to San Francisco, to be combined with similar Chevron functions. Gulf Oil Products chemical operations were to be merged with Chevron Chemical Co.

Gulf Oil Exploration and Production Co.'s international division was to be combined with Chevron Overseas Petroleum Ltd., to be located in San Ramon, Calif.

Gulf Pipe Line Co., Houston, was to be merged with Chevron Pipe Line Co., based in San Francisco.

Warren Petroleum Co., Tulsa, a Gulf subsidiary, was to continue in operation and remain in place. Gulf Mineral Resources Co. was to be merged with Chevron Resources Co.

Chevron offered about 12,000 employees of both firms a voluntary severance program.

Texaco/Getty. Texaco financed its purchase of Getty with about $1 billion in cash and $9 billion in short term borrowings.

It quickly converted about $3.5 billion of the debt to fixed-rate, long term debt and began a program of sales of Getty assets.

By fall it had sold about $1.6 billion of Getty properties and planned further such sales of $500 million-$1.5 billion.

Texaco's 1983 worldwide reserves totaled 1.8 billion bbl of liquids and 8.5 trillion cu ft of gas. Its U.S. reserves were 967 million bbl of liquids and 5.5 trillion cu ft of gas.

Getty reported 1983 worldwide reserves of 1.9 billion bbl of oil and 2.8 trillion cu ft of gas. U.S. reserves totaled 1.2 billion bbl of liquids and 2.2 trillion cu ft of gas.

Like Chevron, Texaco planned hefty workforce cuts. It estimated that by early 1985 its worldwide labor population would have been reduced by as much as 21%—dropping to about 60,000 from 75,000 at the end of 1983.

Mobil/Superior. Mobil's merger of Superior was smaller and, therefore, quicker than the other two, which involved big firms more closely matched in size.

Mobil estimated its acquisition cost at the equivalent of less than $6/bbl of reserves. The firm gained reserves of 314 million bbl of oil and 4.25 trillion cu ft of gas, boosting its net position by 27% in the U.S. and nearly 20% worldwide. Mobil expected the acquisition to provide its own positive cash flow by yearend 1986.

Yearend expectations. As 1984 ended, the outlook for continued merger activity among the biggest U.S. oil firms was uncertain.

The fundamental factors that fed merger fire earlier still were there: uncertain oil prices, which eroded reserves values; stock prices undercutting oil company asset values; general uncertainty about the industry's future; and overall contraction.

But in the wake of the mergers that had occurred by the end of the year, there were fewer potential players in the takeover game. Prospective targets remained, of course. But many firms big enough to acquire them either had been taken over themselves or were busy absorbing their own merger partners.

The outlook was similarly unclear for Pickens of Mesa. Wall Street arbitragers who had followed him through many of his deals lost millions when he called off his Phillips takeover attempt.

There was speculation that they'd be less willing than before to jump into the stock of any firm in which he showed interest. But the degree to which that would hamper future takeover attempts by Pickens and his backers was likely not to be great.

As 1985 began, therefore, an industry that had been shocked by the megamergers of 1984 braced for more. ▣

Worldwide production statistics

NORTH AMERICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Canada	23.5 1.2	79.6 4.0	575.6 26.2	801.4 39.9	1,263.6 62.9	1,335.0 66.5	1,321.0 65.8	1,324.0 65.9	1,496.0 74.5	1,412.0 70.3	1,267.0 63.9	1,233.0 61.2	1,396.0 69.8	1,430.0 71.2
United States	3,707.4 184.6	5,407.1 269.3	7,054.6 351.3	7,804.1 388.6	9,630.0 479.6	8,132.0 405.0	8,245.0 410.6	8,701.0 433.3	8,544.0 425.4	[illegible] 426.7	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Total	3,730.9 185.8	5,486.7 273.3	7,580.2 377.5	8,605.5 428.5	10,893.6 542.5	9,467.0 471.5	9,566.0 476.4	10,025.0 499.2	10,040.0 499.9	9,981.0 497.0	9,875.0 490.2	[illegible] [illegible]	10,065.0 [illegible]	10,180.0 [illegible]

MIDDLE EAST

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Abu Dhabi	— —	— —	— —	281.9 14.0	693.8 34.6	1,590.0 79.2	1,680.0 83.7	1,450.0 72.2	1,464.0 72.9	1,350.0 67.2	1,145.0 56.8	883.0 43.8	757.0 37.8	750.0 37.4
Bahrain	19.3 0.9	30.2 1.5	45.1 2.2	57.0 2.8	76.6 3.8	58.0 [illegible]	54.0 2.7	56.0 2.8	51.0 2.5	48.0 2.4	44.0 2.2	45.0 2.2	41.0 2.0	41.0 2.0
Dubai	— —	— —	— —	— —	— —	315.0 15.7	320.0 15.9	360.0 17.9	354.0 17.6	349.0 17.4	358.0 17.8	357.0 17.7	327.0 16.3	324.0 16.1
Iran	181.2 9.0	664.3 33.1	1,067.6 53.2	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Iraq	60.7 3.0	136.2 6.8	1,004.2 50.0	1,315.2 65.5	1,548.6 77.1	2,415.4 120.3	2,348.2 116.9	2,562.0 127.6	3,434.0 171.0	2,638.0 131.3	892.0 44.3	914.0 45.4	905.0 45.2	1,218.0 60.7
Israel	— —	— —	2.5 0.1	4.0 0.2	70.2 3.5	0.7 —	0.7 —	[illegible] [illegible]	[illegible] [illegible]	1.0 [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Kuwait	— —	344.4 17.1	1,628.2 81.1	2,169.5 108.0	2,734.5 136.2	1,913.0 95.3	1,783.0 88.8	1,865.0 92.9	2,213.0 110.2	1,382.0 68.8	916.0 45.5	675.0 33.5	912.0 45.6	925.0 46.1
Neutral Zone	— —	— —	136.2 6.8	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] 17.7	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Oman	— —	— —	— —	— —	332.4 16.6	366.0 18.2	350.0 17.4	320.0 15.9	295.0 14.7	283.0 14.1	317.0 15.7	328.0 16.2	378.0 18.9	404.0 20.1
Qatar	— —	[illegible] 1.7	175.1 8.7	[illegible] 11.5	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Saudi Arabia	13.9 0.7	546.7 27.2	1,247.1 62.1	2,024.9 100.8	3,548.9 176.7	8,344.0 415.5	9,014.0 448.9	8,059.0 401.3	9,251.0 460.6	9,630.0 479.5	9,642.0 478.6	6,484.0 321.9	4,872.0 243.4	4,545.0 226.3
Sharjah	— —	— —	— —	— —	— —	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Syria	— —	— —	— —	— —	83.1 4.1	175.0 8.7	200.0 10.0	170.0 8.5	163.0 8.1	165.0 8.2	166.0 8.2	175.0 8.7	165.0 82.0	161.0 8.0
Turkey	— —	[illegible] —	7.8 [illegible]	[illegible] 1.5	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Total	275.1 13.6	1,755.7 97.4	5,313.0 264.5	8,359.7 416.2	13,347.8 664.7	22,134.6 1,102.3	22,307.3 1,110.8	21,120.4 1,051.7	21,496.0 1,070.3	18,379.0 915.0	15,694.3 778.1	12,464.3 618.7	11,711.2 583.3	11,452.1 572.6

*Totals may not add due to rounding

EUROPE

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Austria	7.7 0.4	27.9 1.4	45.4 2.3	53.1 2.6	53.3 2.7	37.0 1.8	36.0 1.8	35.0 1.7	35.0 1.7	29.0 1.4	25.0 1.2	25.0 1.2	24.0 1.2	23.0 1.1
Denmark	— —	— —	— —	— —	— —	3.0 0.1	9.0 0.4	10.0 0.5	8.0 0.4	6.0 0.3	15.0 0.8	38.0 1.9	45.0 2.3	45.0 2.2
France	1.4 0.1	2.5 0.1	38.6 1.9	59.5 3.0	45.8 2.3	20.0 1.0	20.0 1.0	21.0 1.0	20.0 1.0	26.0 1.3	34.0 1.7	33.0 1.6	32.0 1.6	35.0 1.7
Germany, Fed. Rep.	20.1 1.0	22.2 1.1	107.3 5.5	158.0 7.7	149.2 7.5	110.0 5.5	108.0 5.4	102.0 5.1	94.0 4.7	90.0 4.5	86.0 4.3	84.0 4.1	81.0 4.0	79.0 3.9
Greece	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	8.0 0.4	21.0 1.0	25.0 1.2	27.0 1.3
Italy	0.2 —	0.2 —	36.9 1.8	42.0 2.2	28.3 1.3	30.0 1.6	18.0 0.9	28.0 1.4	30.0 1.5	30.0 1.5	37.0 1.8	35.0 1.6	37.0 1.8	45.0 2.2
Netherlands	— —	13.4 0.7	36.0 1.8	37.0 1.9	35.8 1.8	31.0 1.5	30.0 1.5	36.0 1.8	25.0 1.2	25.0 1.2	27.0 1.3	28.0 1.4	42.0 2.1	61.0 3.0
Norway	— —	— —	— —	— —	— —	279.0 13.9	270.0 13.4	350.0 17.4	403.0 19.1	528.0 26.3	506.0 25.2	489.0 24.3	600.0 29.9	680.0 34.2
Spain	— —	— —	— —	— —	3.1 0.2	35.4 1.8	19.6 1.0	19.6 1.0	23.2 1.2	32.0 1.6	24.5 1.2	30.6 1.5	59.5 3.0	45.0 2.2
United Kingdom	0.3 —	0.9 —	1.7 0.1	1.7 0.1	1.7 0.1	245.0 12.2	746.0 37.0	1,082.0 53.9	1,568.0 78.1	1,619.0 80.6	1,790.0 88.9	2,080.0 103.6	2,266.5 113.0	2,492.0 124.1
Total	29.7 1.5	67.1 3.3	266.5 13.2	353.3 17.9	313.7 15.6	785.0 38.9	1,258.0 62.3	1,664.0 82.6	2,169.0 108.1	2,282.0 113.7	2,550.0 126.6	2,825.0 140.2	3,238.5 160.3	3,508.0 175.2

ASIA-PACIFIC

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Afghanistan	— —	— —	— —	— —	— —	0.2 —	0.2 —	0.2 —	— —	— —	— —	— —	— —	— —
Australia	— —	— —	— —	7.2 0.4	175.6 8.7	417.0 20.8	431.0 21.5	430.0 21.4	441.0 22.0	379.0 18.9	382.0 19.0	358.0 17.8	405.0 20.2	481.0 23.9
Brunei	19.3 1.0	84.8 4.2	92.9 4.6	80.4 4.0	148.0 7.4	200.0 10.0	207.0 10.3	210.0 10.5	256.0 12.7	230.0 11.5	176.0 8.2	155.0 7.7	155.0 7.7	160.0 8.0
Burma	21.1 1.0	1.9 0.1	11.1 0.6	12.1 0.6	16.4 0.8	20.0 1.0	23.0 1.1	25.0 1.2	30.0 1.5	30.0 1.5	30.0 1.5	30.0 1.5	30.0 1.5	30.0 1.5
India	3.9 0.2	5.1 0.2	9.0 0.4	61.8 3.1	138.6 6.9	180.0 9.0	200.0 10.0	230.0 11.5	245.0 12.2	182.0 9.1	298.0 14.8	384.0 19.1	390.0 19.5	543.0 27.0
Indonesia	169.4 8.4	132.6 6.6	411.2 20.5	486.0 24.1	853.6 42.5	1,503.6 74.9	1,686.1 84.0	1,638.2 81.4	1,595.0 79.4	1,575.0 78.5	1,607.0 80.0	1,341.0 66.8	1,290.0 64.6	1,332.0 66.3
Japan	7.2 0.4	5.6 0.3	10.2 0.5	11.4 0.6	16.3 0.7	12.0 0.6	10.0 0.5	10.0 0.5	8.0 0.4	10.0 0.5	7.0 0.3	6.0 0.3	6.9 0.3	6.4 0.3
Malaysia	— —	— —	— —	— —	— —	161.0 8.0	190.0 9.5	210.0 10.5	260.0 12.9	288.0 14.3	259.0 12.9	306.0 15.2	370.0 18.5	462.0 23.0
New Guinea	— —	4.8 0.2	4.2 0.2	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —
New Zealand	— —	— —	— —	— —	— —	10.0 0.5	15.0 0.7	13.0 0.6	9.0 0.4	7.0 0.3	10.0 0.5	15.0 0.7	15.0 0.7	18.0 0.8
Pakistan	2.4 0.1	3.5 0.2	7.2 0.4	11.2 0.6	9.9 0.5	7.0 0.3	10.0 0.5	9.3 0.5	10.0 0.5	10.0 0.5	10.0 0.5	12.0 0.6	13.0 0.6	18.0 0.9
Philippines	— —	— —	— —	— —	— —	— —	— —	— —	30.0 1.5	15.0 0.7	2.0 0.1	7.0 0.3	15.0 0.7	12.0 0.6
Taiwan	— —	— —	0.4 —	0.4 —	1.8 0.1	4.2 0.2	5.0 0.2	4.3 0.2	5.0 0.2	5.0 0.2	3.0 0.1	3.0 0.1	2.3 0.1	2.6 0.1
Thailand	— —	— —	— —	— —	0.4 —	0.3 —	0.2 —	0.2 —	— —	— —	— —	6.0 0.3	13.0 0.6	18.0 0.9
Total	223.3 11.1	237.8 11.8	546.2 27.2	669.5 33.4	1,360.6 67.7	2,515.3 125.3	2,777.5 138.3	2,777.2 138.3	2,853.0 143.5	2,732.0 136.0	2,234.0 110.9	2,610.0 129.0	2,705.2 135.2	3,094.0 153.6

AFRICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Algeria	— —	— —	182.7 9.1	551.6 27.5	1,029.1 51.2	1,075.1 53.5	1,152.3 57.4	1,161.2 57.8	1,175.0 58.5	1,016.0 50.6	750.0 37.2	750.0 37.2	686.6 34.3	608.0 30.3
Angola (inc. Cabinda)	... ...	... ...	**1.3** **0.1**	**13.0** **0.6**	**13.7** **0.7**	**108.0** **5.4**	**195.0** **9.7**	**130.0** **6.5**	**147.0** **7.3**	**150.0** **7.5**	**140.0** **6.9**	**122.0** **6.1**	**174.0** **8.7**	**207.0** **10.3**
Cameroon	— —	— —	— —	— —	— —	— —	— —	10.0 0.5	34.0 1.7	58.0 2.9	87.0 4.3	109.0 5.4	114.0 5.7	125.0 6.2
Congo	... ...	... ...	... ...	... ...	... ...	**39.0** **1.9**	**35.0** **1.7**	**28.0** **1.4**	**57.0** **2.8**	**56.0** **2.8**	**79.0** **3.9**	**87.0** **4.3**	**95.0** **4.7**	**118.0** **5.9**
Egypt	18.1 0.9	44.9 2.2	61.6 3.1	122.7 6.1	327.3 16.3	328.0 16.3	413.0 20.6	464.0 23.1	526.0 26.2	596.0 29.7	578.0 28.7	667.0 33.1	690.0 34.5	790.0 39.3
Gabon	... ...	... ...	**16.1** **0.8**	**25.2** **1.3**	**108.8** **5.4**	**222.8** **11.1**	**222.0** **11.1**	**208.7** **10.4**	**204.0** **10.2**	**180.0** **9.0**	**147.0** **7.3**	**130.0** **6.5**	**150.0** **7.5**	**150.0** **7.5**
Ivory Coast	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	7.0 0.3	9.0 0.4	24.0 1.2	22.0 1.1
Libya	... ...	... ...	... ...	**1,220.0** **60.8**	**3,318.0** **166.2**	**1,932.6** **96.2**	**2,063.4** **102.8**	**1,982.5** **98.7**	**2,066.0** **102.9**	**1,785.0** **88.9**	**1,060.0** **52.8**	**1,127.0** **55.9**	**1,020.0** **51.0**	**1,090.0** **54.3**
Nigeria	— —	— —	17.3 0.9	272.2 13.6	1,083.3 53.9	2,066.8 102.9	2,085.1 103.8	1,897.0 94.5	2,303.0 114.7	2,057.0 102.4	1,369.0 68.0	1,324.0 65.7	1,232.0 61.6	1,414.0 70.4
Tunisia	... ...	... ...	**3.0** **0.1**	**3.6** **0.2**	**87.7** **4.4**	**73.0** **3.6**	**87.0** **4.3**	**100.0** **5.0**	**100.0** **5.0**	**110.0** **5.5**	**118.0** **5.8**	**106.0** **5.3**	**115.0** **5.7**	**114.0** **5.7**
Zaire	— —	— —	— —	— —	— —	20.0 1.0	24.0 1.2	20.0 1.0	21.0 1.0	20.0 1.0	20.0 1.0	22.0 1.1	26.0 1.3	27.0 1.3
Others	... ...	**0.8** ...	**3.0** **0.1**	**3.6** **0.2**	**1.5** **0.1**	**0.1** ...	**0.4** ...	**0.1** ...	**5.0** **0.2**	**4.0** **0.2**	**9.2** **0.5**	**10.7** **0.5**	**6.6** **0.3**	**7.7** **0.3**
Total	**18.1** **0.9**	**45.7** **2.2**	**285.0** **14.2**	**2,211.9** **110.3**	**5,969.4** **297.2**	**5,865.4** **291.9**	**6,277.2** **312.6**	**6,001.5** **298.9**	**6,637.0** **330.5**	**6,032.0** **300.3**	**4,360.2** **216.4**	**4,454.7** **221.1**	**4,548.6** **227.3**	**4,672.7** **232.7**

LATIN AMERICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Argentina	56.3 2.8	64.0 3.2	171.9 8.6	269.3 13.4	382.9 19.1	398.0 19.8	431.0 21.5	453.0 22.6	467.0 23.3	487.0 24.2	497.0 24.7	483.0 24.0	481.0 24.0	467.0 23.2
Bolivia	**0.8** ...	**1.7** **0.1**	**9.8** **0.5**	**9.2** **0.5**	**16.3** **0.8**	**41.0** **2.0**	**35.0** **1.7**	**30.0** **1.5**	**30.0** **1.5**	**30.0** **1.5**	**24.0** **1.2**	**24.0** **1.2**	**22.0** **1.1**	**20.0** **1.0**
Brazil	... ...	0.9 ...	80.9 4.0	94.0 4.7	160.5 8.0	171.0 8.5	162.0 8.1	160.0 8.0	161.0 8.0	182.0 9.1	215.0 10.7	252.0 12.5	315.0 15.7	437.0 21.8
Chile	... ...	**1.7** **0.1**	**19.8** **1.0**	**34.9** **1.7**	**34.6** **1.7**	**24.0** **1.2**	**22.0** **1.1**	**20.7** **1.0**	**23.0** **1.1**	**29.0** **1.4**	**40.0** **2.0**	**41.0** **2.0**	**39.0** **1.9**	**38.0** **1.9**
Colombia	69.9 3.5	93.3 4.6	152.7 7.6	210.0 10.0	214.0 10.7	147.0 7.3	140.0 7.0	130.0 6.5	124.0 6.2	125.0 6.2	125.0 6.2	140.0 6.9	155.0 7.7	165.0 8.2
Ecuador	**6.4** **0.3**	**7.2** **0.4**	**7.7** **0.4**	**8.0** **0.4**	**4.1** **0.2**	**187.8** **9.3**	**183.4** **9.1**	**201.8** **10.0**	**225.0** **11.2**	**222.0** **11.1**	**204.0** **10.1**	**215.0** **10.7**	**236.0** **11.8**	**254.0** **12.6**
Guatemala	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	2.0 0.1	5.0 0.2	5.0 0.2	6.4 0.3	7.5 0.3	5.2 0.3
Mexico	**120.3** **6.0**	**198.5** **9.9**	**270.6** **13.5**	**323.1** **16.1**	**430.2** **21.4**	**894.0** **44.5**	**981.0** **48.8**	**1,207.0** **60.1**	**1,461.9** **72.7**	**1,936.0** **96.4**	**2,390.0** **118.6**	**2,734.0** **135.7**	**2,702.0** **136.0**	**2,743.0** **136.6**
Peru	33.2 1.6	41.1 2.0	52.6 2.6	63.2 3.1	72.2 3.6	75.0 3.7	90.0 4.5	150.0 7.5	195.0 9.7	191.0 9.5	184.0 9.1	198.0 9.8	171.0 8.5	201.0 10.0
Trinidad & Tobago	**60.9** **3.0**	**56.5** **2.8**	**115.7** **5.8**	**133.9** **6.7**	**139.8** **7.0**	**224.0** **11.2**	**230.0** **11.5**	**240.0** **12.0**	**215.0** **10.7**	**211.0** **10.5**	**240.0** **11.9**	**182.0** **9.0**	**158.0** **7.9**	**169.0** **8.4**
Venezuela	507.0 25.2	1,498.0 74.6	2,846.1 141.7	3,472.9 172.9	3,708.0 184.7	2,294.4 114.3	2,237.9 111.4	2,165.5 107.8	2,356.0 117.3	2,167.0 107.9	2,093.0 103.9	1,826.0 90.6	1,791.0 89.5	1,724.0 85.9
Others	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	**0.6** ...	**0.5** ...	**2.2** **0.1**
Total	**854.8** **42.4**	**1,962.9** **97.7**	**3,727.8** **185.7**	**4,609.5** **229.5**	**5,162.6** **257.2**	**4,456.4** **221.8**	**4,512.3** **224.7**	**4,758.0** **237.0**	**5,259.0** **261.8**	**5,586.0** **278.1**	**6,017.0** **298.7**	**6,102.0** **302.9**	**6,078.0** **303.7**	**6,225.4** **310.0**
Total non-Communist	[illegible] [illegible]	**9,596.0** [illegible]	**17,716.7** [illegible]	**24,808.4** **1,231.5**	**37,047.7** [illegible]	**45,223.8** [illegible]	**46,086.6** [illegible]	**46,305.2** [illegible]	**48,515.0** [illegible]	**42,417.3** [illegible]	**40,735.5** [illegible]	**38,352.0** [illegible]	**38,314.0** [illegible]	**39,120.0** [illegible]

ONE of the large pumping units used at an Amoco well in Argentina is checked by an employee.

COMMUNIST AREAS

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1965	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984
Bulgaria	....	....	4.0	4.6	6.7	2.4	2.6	5.1	5.3	6.0	6.0	3.0	3.0	3.0
	....	....	0.2	0.2	0.3	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.1
China	....	4.0	100.0	220.0	500.0	1,736.0	1,874.0	2,090.4	2,130.5	2,119.0	2,024.4	2,042.0	2,120.0	2,250.0
	....	0.2	5.0	11.0	24.9	86.5	93.3	104.1	106.1	105.9	101.2	102.1	106.0	112.5
Czechoslovakia	....	0.8	2.7	3.9	4.1	2.6	2.5	2.3	2.2	1.9	1.7	2.0	2.0	2.0
	....	....	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
German Dem. Rep.	....	1.0	1.0	1.0	1.2	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	....	....	....	....	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Hungary	....	10.1	24.3	36.1	38.7	43.0	44.0	44.1	40.7	40.6	40.5	41.0	40.0	40.0
	....	0.5	1.2	1.8	1.9	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0
Poland	....	3.3	3.9	6.8	8.5	9.1	7.3	7.3	6.6	6.6	6.0	4.0	5.0	5.0
	....	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3
Romania	....	87.7	231.0	252.4	268.6	295.2	294.2	275.6	247.0	230.9	232.0	234.0	240.0	250.0
	....	4.4	11.5	12.6	13.4	14.7	14.7	13.7	12.3	11.5	11.6	11.7	12.0	12.5
U.S.S.R.*	624.9	760.6	2,988.1	4,877.3	7,069.2	10,435.3	10,959.8	11,476.6	11,758.5	12,031.0	12,140.0	12,260.0	12,320.0	12,260.0
	31.1	37.9	147.9	242.9	363.0	519.7	546.8	571.5	586.6	603.2	609.0	613.0	616.0	613.0
Yugoslavia	0.3	2.1	18.8	407	57.8	77.5	79.0	82.0	70.0	84.5	87.6	87.0	82.0	80.0
	....	0.1	0.9	2.0	2.9	3.9	3.9	4.1	3.5	4.2	4.4	4.3	4.1	4.0
Others	....	2.7	14.9	19.0	57.1	50.0	50.0	50.0	50.0	50.0	97.2	81.0	86.0	95.0
	....	0.1	0.7	0.9	1.8	2.5	2.5	2.6	2.5	2.6	2.9	4.1	4.3	4.8
Total	625.2	872.3	3,388.7	5,461.8	8,011.9	12,661.1	13,323.4	14,043.4	14,320.8	14,580.0	14,645.4	14,764.0	14,908.0	14,996.0
	31.1	43.3	167.3	271.1	397.7	628.5	661.4	697.1	710.9	730.5	732.3	738.0	745.4	749.8
*Includes gas liquids														
World Total	5,757.1	10,428.3	21,088.4	30,271.2	45,059.6	57,885.0	60,020.0	60,410.2	62,835.8	56,997.3	55,380.9	53,116.0	53,222.0	54,116.0
	286.4	519.1	1,050.1	1,507.4	2,243.9	2,882.4	2,988.7	3,008.4	3,128.7	2,829.3	2,757.7	2,641.8	2,680.1	2,698.0

World oil consumption

Upper figures = 1,000 b/d
Lower figures = million t/y

	1981	1982	1983
U.S.A.	15,550 746.0	14,765 705.5	14,705 700.3
Canada	1,760 81.7	1,565 72.9	1,420 66.5
Total North America	17,310 827.7	16,330 778.4	16,125 766.8
Latin America	4,445 212.9	4,665 223.5	4,555 217.9
Total Western Hemisphere	**21,755** 1,140.6	**20,995** 1,001.9	**20,680** 984.7
Austria	225 11.0	210 10.5	205 10.0
Belgium & Luxembourg	500 24.5	475 23.3	435 21.2
Denmark	250 12.8	225 11.0	215 10.4
Finland	245 12.3	230 11.3	210 10.4
France	2,040 98.0	1,915 91.5	1,880 88.3
Germany, Fed. Rep.	2,465 131.1	2,355 117.6	2,320 112.2
Greece	240 11.9	245 11.9	235 11.5
Ireland	110 5.2	95 4.6	90 4.2
Italy	1,940 95.7	1,845 90.7	1,810 88.7
Netherlands	735 35.7	655 31.0	620 29.1
Norway	155 7.5	155 7.7	155 7.6
Portugal	180 8.8	195 9.5	195 9.4
Spain	1,040 50.4	990 47.8	980 47.6
Sweden	445 21.8	440 21.8	405 20.0
Switzerland	250 11.9	235 11.2	255 12.3
United Kingdom	1,585 74.7	1,580 75.8	1,530 72.4
Yugoslavia	285 14.4	280 14.1	260 13.0
Other	355 17.4	375 18.6	390 18.8
Total Western Europe	13,045 632.6	12,500 604.3	12,190 585.7
Middle East	1,695 84.7	1,745 87.9	1,805 90.4
Africa	1,565 75.9	1,650 79.5	1,670 80.3
South Asia	880 43.4	905 45.6	955 46.4
Southeast Asia	2,310 115.6	2,270 113.5	2,290 114.5
Japan	4,740 223.9	4,395 207.8	4,310 205.8
Australasia	760 35.8	730 34.4	705 33.2
U.S.S.R.	8,885 444.1	9,075 448.6	9,115 450.5
Eastern Europe	2,480 120.3	2,450 119.1	2,425 117.8
China	1,755 84.9	1,690 82.4	1,755 84.7
Total Eastern Hemisphere	**38,115** **1,861.1**	**37,410** **1,823.0**	**37,220** **1,809.3**
World excl. U.S.S.R. China & E. Europe	**46,750** **2,252.4**	**45,190** **2,174.8**	**44,605** **2,141.0**
World Total	**59,870** **2,901.7**	**58,405** **2,824.9**	**57,900** **2,794.0**

Source: British Petroleum
South Asia—Afghanistan, Bangladesh, Burma, India, Pakistan, Sri Lanka Southeast Asia—Brunei, Malaysia, Kampuchea, Indonesia, Hong Kong, Korea, Laos, Philippines, Singapore, Thailand, Taiwan, Viet Nam Australasia—Australia, Papua New Guinea, New Zealand, SW Islands

Worldwide refining capacity

EUROPE

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Austria	— —	26 1.3	47 2.3	98 4.9	280 13.9	280 13.9	280 13.9	280 13.9	280 13.9	280 13.9	244 12.1	269 13.4	268 13.3	273 13.6
Belgium	12 0.6	16 0.8	171 8.5	[illegible] 34.8	946 47.1	[illegible] 54.5	1,067 53.1	972 48.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	693 34.5
Cyprus	— —	— —	— —	— —	15 0.7	15 0.7	15 0.7	15 0.7	16 0.8	16 0.8	14 0.7	16 0.8	15 0.7	16 0.8
Denmark	1	1 —	— —	173 8.6	226 11.3	226 11.3	[illegible]	215 10.7	214 10.7	215 10.7	215 10.7	215 10.7	[illegible] 8.7	176 8.8
Finland	— —	— —	25 1.2	176 8.8	336 16.7	336 16.7	336 16.7	336 16.7	336 16.7	336 16.7	299 14.8	299 14.8	299 14.8	299 14.8
France	152 7.6	306 15.2	[illegible]	[illegible]	[illegible]	3,517 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,471 [illegible]	[illegible]	2,386 118.8
Germany, Fed. Rep.	48 2.4	81 4.0	573 28.5	2,351 117.1	3,103 154.5	3,075 153.1	3,081 153.4	3,103 154.5	2,986 148.7	3,021 150.4	2,937 145.8	2,471 122.7	2,386 118.8	2,172 108.2
Greece	— —	— —	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	411 20.5	[illegible]	[illegible] 21.3	427 21.2	[illegible]	[illegible]	390 19.4
Ireland	11 0.5	— —	40 2.0	54 2.7	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8	56 2.8
Italy	41 2.0	107 5.3	773 38.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3,095 154.1
Netherlands	15 0.7	77 3.8	359 17.9	1,456 72.5	1,985 98.8	2,031 101.1	1,869 93.1	1,857 92.5	1,828 91.0	1,827 91.0	1,708 84.8	1,552 77.0	1,552 77.0	1,499 74.7
Norway	1	1 —	2 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	244 12.1
Portugal	4 0.2	8 0.4	23 1.1	82 4.1	190 9.5	190 9.5	415 20.7	361 18.0	378 18.8	341 17.0	365 18.1	365 18.1	282 14.0	290 14.4
Spain	11 0.5	17 0.8	144 7.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 74.4
Sweden	4 0.2	26 1.3	48 2.4	253 12.6	413 20.6	434 21.6	424 21.1	411 20.5	458 22.8	451 22.5	471 23.4	453 22.5	453 22.5	439 21.9
Switzerland	—	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	127 6.3
United Kingdom	133 6.6	197 9.8	962 47.9	2,420 120.5	2,889 143.9	3,014 150.5	2,911 145.0	2,527 125.8	2,527 125.8	2,629 130.9	2,482 123.2	2,260 112.1	2,092 104.2	2,007 99.9
Yugoslavia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	257 14.8
Total Europe	**429 21.1**	**860 42.6**	**3,978 198.1**	**14,651 729.6**	**20,253 1,008.5**	**20,857 1,038.5**	**20,720 1,032.1**	**20,328 1,012.1**	**20,243 1,007.9**	**20,206 1,006.1**	**19,741 978.9**	**17,424 867.6**	**16,530 814.0**	**15,952 794.3**

HISTORICAL REFINING CAPACITY STATISTICS

LATIN AMERICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Argentina	103 5.1	152 7.6	238 11.9	502 25.0	684 34.1	703 35.0	655 32.6	655 32.6	676 33.7	679 33.8	677 33.6	676 33.5	678 33.8	678 33.8
Bahamas	... ...	... ...	... ...	... ...	500 24.9	500 24.9	500 24.9	500 24.9	500 24.9	500 24.9	500 24.9	500 24.9	500 24.9	350 17.4
Barbados	... ...	... ...	... ...	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1
Bolivia	1 —	7 0.3	12 0.6	21 1.0	34 1.7	37 1.8	40 2.0	74 3.7	74 3.7	74 3.7	61 3.0	61 3.0	47 2.3	47 2.3
Brazil	4 0.2	12 0.6	156 7.8	575 28.6	986 49.1	1,118 55.7	1,161 57.8	1,209 60.2	1,205 60.0	1,402 69.8	1,407 69.8	1,219 60.5	1,301 64.8	1,305 65.0
Chile	1 —	4 0.2	24 1.2	115 5.7	149 7.4	140 7.0	130 6.5	144 7.2	139 6.9	139 6.9	141 7.0	141 7.0	141 7.0	141 7.0
Colombia	15 0.7	24 1.2	51 2.5	140 7.0	172 8.6	165 8.2	165 8.2	174 8.7	193 9.6	199 9.9	199 9.9	214 10.6	211 10.5	211 10.5
Costa Rica	... ...	... ...	... ...	8 0.4	8 0.4	8 0.4	10 0.5	12 0.6	11 0.5	15 0.7	15 0.7	16 0.8	17 0.8	16 0.8
Cuba	4 0.2	7 0.3	87 4.3	93 4.6	122 6.1	122 6.1	122 6.1	160 8.0	160 8.0	160 8.0	160 8.0	160 8.0	160 8.0	160 8.0
Ecuador	2 0.1	5 0.2	7 0.3	37 1.8	44 2.2	41 2.0	96 4.8	93 4.6	86 4.3	87 4.3	90 4.3	79 3.9	84 4.2	82 4.1
El Salvador	... ...	... ...	... ...	14 0.7	16 0.8	16 0.8	17 0.8	17 0.8	16 0.8	16 0.8	16 0.8	16 0.8	16 0.8	16 0.8
Guatemala	... ...	... ...	... ...	21 1.0	25 1.2	14 0.7	14 0.7	14 0.7	16 0.8	16 0.8	16 0.8	16 0.8	16 0.8	16 0.8
Honduras	... ...	... ...	... ...	10 0.5	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7	14 0.7
Jamaica	... ...	... ...	... ...	28 1.4	33 1.6	33 1.6	33 1.6	33 1.6	34 1.7	22 1.1	22 1.1	36 1.8	36 1.8	36 1.8
Mexico	98 4.9	160 8.0	357 17.8	515 25.6	760 37.8	935 46.6	1,384 68.9	1,244 61.9	1,394 69.4	1,394 69.4	1,470 73.0	1,289 64.0	1,269 63.2	1,269 63.2
Netherlands Antilles	495 24.6	617 30.7	680 33.9	795 39.6	849 42.3	810 40.3	842 41.9	842 41.9	792 39.4	782 38.9	782 38.9	782 38.9	740 36.8	740 36.8
Nicaragua	... ...	... ...	... ...	21 1.0	13 0.6	15 0.7	15 0.7	15 0.7	14 0.7	14 0.7	14 0.7	14 0.7	15 0.7	15 0.7
Panama	... ...	... ...	... ...	140 7.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0	100 5.0
Paraguay	... ...	... ...	... ...	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	7 0.4	8 0.4	8 0.4	8 0.4	8 0.4	8 0.4
Peru	22 1.1	35 1.7	49 2.4	104 5.2	130 6.5	116 5.8	171 8.5	171 8.5	170 8.5	169 8.4	162 8.0	166 8.3	169 8.4	176 8.8
Puerto Rico	... ...	... ...	84 4.2	155 7.7	283 14.1	283 14.1	284 14.1	284 14.1	284 14.1	284 14.1	284 14.1	123 6.1	121 6.0	121 6.0
Trinidad & Tobago	49 2.4	104 5.2	182 9.1	417 20.8	461 23.0	461 23.0	461 23.0	461 23.0	456 22.7	456 22.7	456 22.7	375 18.6	375 18.6	320 15.9
Uruguay	5 0.2	16 0.8	28 1.4	40 2.0	46 2.3	46 2.3	43 2.1	43 2.1	40 2.0	40 2.0	45 2.2	45 2.2	45 2.2	45 2.2
Venezuela	55 2.7	254 12.6	886 44.1	1,324 65.9	1,451 72.3	1,446 72.0	1,446 72.0	1,446 72.0	1,446 72.0	1,349 67.2	1,323 65.7	1,264 62.7	1,224 60.9	1,224 60.9
Virgin Islands	... ...	... ...	... ...	220 11.0	728 36.2	728 36.2	728 36.2	728 36.2	728 36.2	728 36.2	640 31.8	600 29.8	600 29.8	545 27.1
Others	... ...	... ...	... ...	31 1.5	74 3.7	46 2.3	58 2.9	60 3.0	62 3.1	62 3.1	59 2.9	77 3.8	55 2.7	57 2.8
Total	**854** **42.2**	**1,397** **69.4**	**2,841** **141.5**	**5,334** **265.3**	**7,690** **382.9**	**7,905** **393.5**	**8,497** **422.8**	**8,501** **423.0**	**8,620** **429.1**	**8,712** **433.6**	**8,664** **430.0**	**8,016** **399.2**	**7,945** **395.2**	**7,695** **382.9**

NORTH AMERICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Canada	203 10.1	329 16.4	1,002 49.9	1,355 67.5	2,076 103.4	2,100 104.6	2,126 105.9	2,225 110.8	2,222 110.6	2,168 107.9	2,200 109.2	2,020 100.3	1,807 90.0	1,869 93.1
United States	**4,460** **222.1**	**6,696** **333.5**	**10,400** **517.9**	**12,079** **601.5**	**15,043** **749.1**	**15,930** **793.3**	**16,171** **805.3**	**17,150** **854.1**	**17,720** **882.5**	**18,470** **919.6**	**18,700** **928.3**	**16,800** **834.0**	**15,930** **793.2**	**15,400** **766.0**
Total	**4,663** **232.2**	**7,025** **349.9**	**11,402** **567.8**	**13,434** **669.0**	**17,119** **852.5**	**18,030** **897.9**	**18,297** **911.2**	**19,375** **964.9**	**19,942** **993.1**	**20,638** **1,027.5**	**20,900** **1,037.5**	**18,820** **934.3**	**17,737** **883.2**	**17,269** **860.0**

ASIA-PACIFIC

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Australia	4 0.2	14 0.7	237 11.8	581 28.9	707 35.2	706 35.2	709 35.3	708 35.3	725 36.1	743 37.0	742 36.8	716 35.5	722 35.9	697 34.7
Bangladesh	... ...	... ...	... ...	... ...	**31** **1.5**	**31** **1.5**	**31** **1.5**	**31** **1.5**	**31** **1.5**	**31** **1.5**	**31** **1.5**	**31** **1.5**	**22** **1.1**	**31** **1.5**
Brunei-Malaysia-Singapore	10 0.5	10 0.5	46 2.3	302 15.0	1,001 49.8	1,085 54.0	1,086 54.1	1,058 52.7	1,093 54.4	1,246 62.0	1,271 63.1	1,271 63.1	1,313 65.5	1,286 64.0
Burma*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	**26** **1.3**	**26** **1.3**	**26** **1.3**	**26** **1.3**	**26** **1.3**
Guam*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	44 2.2	44 2.2	44 2.2	44 2.2	44 2.2
India	**10** **0.5**	**6** **0.3**	**112** **5.6**	**436** **21.7**	**564** **28.1**	**567** **28.2**	**564** **28.1**	**626** **31.2**	**557** **27.7**	**557** **27.7**	**557** **27.7**	**753** **37.4**	**779** **38.8**	**705** **35.1**
Indonesia	170 8.5	203 10.1	274 13.6	268 13.3	428 21.3	428 21.3	528 26.3	528 26.3	528 26.3	445 22.2	498 24.7	341 16.9	387 19.3	631 31.4
Japan	**53** **2.6**	**34** **1.7**	**640** **31.9**	**2,796** **139.2**	**5,417** **269.8**	**5,552** **276.5**	**5,467** **272.2**	**5,480** **272.9**	**5,509** **274.3**	**5,454** **271.6**	**5,601** **278.0**	**5,548** **275.4**	**5,020** **250.0**	**4,813** **239.7**
Korea, South	... ...	... ...	... ...	175 8.7	435 21.7	424 21.1	475 23.6	542 27.0	601 29.9	607 30.2	755 37.5	755 37.5	776 38.6	776 38.6
New Zealand*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	**74** **3.6**	**74** **3.6**	**74** **3.6**	**74** **3.6**	**53** **2.6**
Okinawa*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	208 10.4	208 10.4	183 9.1	153 7.6	153 7.6
Pakistan	... ...	**5** **0.2**	**6** **0.3**	**115** **5.7**	**74** **3.7**	**74** **3.7**	**106** **5.3**	**110** **5.5**	**98** **4.9**	**122** **6.1**	**133** **6.6**	**133** **6.6**	**126** **6.3**	**129** **6.4**
Philippines	... ...	... ...	22 1.1	180 9.0	247 12.3	251 12.5	253 12.6	253 12.6	253 12.6	246 12.2	286 14.2	286 14.2	286 14.2	286 14.2
Sir Lanka*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	**50** **2.5**	**50** **2.5**	**50** **2.5**	**50** **2.5**	**50** **2.5**
Taiwan	... ...	... ...	28 1.4	129 6.4	335 16.7	425 21.2	425 21.2	425 21.2	425 21.2	515 25.6	515 25.6	515 25.6	515 25.6	543 27.0
Thailand	... ...	... ...	**1**	**62** **3.1**	**166** **8.3**	**161** **8.0**	**160** **8.0**	**160** **8.0**	**186** **9.3**	**186** **9.3**	**176** **8.7**	**176** **8.7**	**176** **8.7**	**172** **8.6**
Others	27 1.3	4 0.2	9 0.4	137 6.8	374 18.6	369 18.4	373 18.6	364 18.1	380 18.9	... ...	... ...	... ...	... ...	... ...
Total	**274** **13.6**	[illegible] **13.7**	**1,376** **68.4**	[illegible] **257.8**	[illegible] **437.0**	[illegible] **501.6**	**10,177** **506.8**	[illegible] **512.3**	[illegible] **517.1**	[illegible] **525.5**	[illegible] **545.3**	[illegible] **541.1**	**10,473** **521.5**	[illegible] **517.7**

*Prior to 1981, included in others

AFRICA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Algeria	... ...	... ...	... ...	47 2.3	122 6.1	122 6.1	122 6.1	122 6.1	122 6.1	122 6.1	122 6.1	137 6.8	137 6.8	464 23.1
Angola-Cabinda	— —	— —	2 0.1	20 1.0	35 1.7	32 1.6	32 1.6	32 1.6	36 1.8	31 1.5	32 1.6	32 1.6	32 1.6	32 1.6
Cameroon*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	43 2.1	43 2.1	41 2.0	43 2.1
Congo*	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	21 1.0	21 1.0
Egypt	17 0.8	39 1.9	87 4.3	193 9.6	180 9.0	236 11.8	234 11.7	251 12.5	234 11.6	292 14.5	292 14.5	341 16.9	369 18.4	369 18.4
Ethiopia*	— —	— —	— —	— —	— —	— —	— —	— —	— —	14 0.7	14 0.7	14 0.7	15 0.7	14 0.7
Gabon*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	20 1.0	20 1.0	20 1.0	20 1.0	20 1.0
Ghana	— —	— —	— —	29 1.4	28 1.4	26 1.3	26 1.3	26 1.3	26 1.3	26 1.3	27 1.3	27 1.3	28 1.4	28 1.4
Ivory Coast	... ...	... ...	... ...	19 0.9	40 2.0	41 2.0	39 1.9	39 2.0	50 2.5	50 2.5	50 2.5	90 4.5	90 4.5	90 4.5
Kenya	— —	— —	— —	44 2.2	86 4.3	86 4.3	95 4.7	95 4.7	95 4.7	95 4.7	79 3.9	79 3.9	79 3.9	95 4.7
Liberia*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	15 0.7	15 0.7	15 0.7	15 0.7	15 0.7
Libya	— —	— —	— —	10 0.5	76 3.8	135 6.7	135 6.7	137 6.8	138 6.9	142 7.1	130 6.5	130 6.5	125 6.2	330 16.4
Madagascar*	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	11 0.5	11 0.5	16 0.8	16 0.8	16 0.8
Morocco	— —	— —	2 0.1	35 1.7	68 3.4	68 3.4	72 3.6	72 3.6	72 3.6	72 3.6	72 3.6	74 3.7	74 3.7	78 3.9
Mozambique	... ...	... ...	... ...	20 1.0	11 0.5	11 0.5	11 0.5	16 0.8	16 0.8	16 0.8	16 0.8	16 0.8	17 0.8	17 0.8
Nigeria	— —	— —	— —	40 2.0	57 2.8	60 3.0	60 3.0	159 7.9	160 8.0	160 8.0	254 12.6	260 12.9	247 12.3	250 12.5
Senegal	... ...	... ...	... ...	13 0.6	12 0.6	19 0.9	20 1.0	20 1.0	20 1.0	20 1.0	18 0.9	18 0.9	18 0.9	30 1.5
Sierra Leone*	— —	— —	— —	— —	— —	— —	— —	— —	— —	10 0.5	10 0.5	10 0.5	10 0.5	10 0.5
South Africa	1 ...	... ...	25 1.2	178 8.9	434 21.6	433 21.6	446 22.2	478 23.8	478 23.8	469 23.4	424 21.0	424 21.0	389 19.4	389 19.4
Sudan	— —	— —	— —	20 1.0	24 1.2	24 1.2	24 1.2	26 1.3	26 1.3	24 1.2	24 1.2	24 1.2	24 1.2	24 1.2
Tanzania	... ...	... ...	... ...	14 0.7	16 0.8	12 0.6	12 0.6	17 0.8	17 0.8	12 0.6	14 0.7	17 0.8	17 0.8	14 0.7
Togo*	— —	— —	— —	— —	— —	— —	— —	— —	— —	20 1.0	20 1.0	20 1.0	20 1.0	20 1.0
Tunisia	... ...	... ...	... ...	23 1.1	23 1.1	22 1.1	22 1.1	34 1.7	34 1.7	34 1.7	34 1.7	34 1.7	34 1.7	34 1.7
Zaire*	— —	— —	— —	— —	— —	— —	— —	— —	— —	17 0.8	17 0.8	17 0.8	17 0.8	17 0.8
Others	... ...	... ...	... ...	87 4.3	108 5.4	117 5.8	117 5.8	143 7.1	142 7.1	10 0.5	10 0.5	... ...	... ...	25 1.2
Total	18 0.8	39 1.9	116 5.7	792 39.2	1,320 65.7	1,444 71.9	1,487 73.8	1,667 83.0	1,666 83.0	1,707 85.1	1,773 88.8	1,872 93.4	1,880 93.8	2,447 121.8

*New in 1981, included in others

MIDDLE EAST

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Abu Dhabi*	— —	— —	— —	... ...	... ...	... ...	... ...	... ...	... ...	14 0.7	128 6.3	135 6.7	185 9.2	185 9.2
Bahrain	33 1.6	150 7.5	187 9.3	265 13.2	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4	250 12.4
Iran	333 16.6	502 25.0	495 24.6	702 35.0	781 38.9	780 38.8	910 45.3	921 45.9	921 45.9	1.121 55.8	530 26.3	530 26.3	530 26.3	530 26.4
Iraq	4 0.2	9 0.4	56 2.8	83 4.1	169 8.4	168 8.4	168 8.4	168 8.4	168 8.4	168 8.4	169 8.4	169 8.4	169 8.4	319 15.9
Israel	— —	83 4.1	87 4.3	115 5.7	181 9.0	201 10.0	201 10.0	195 9.7	195 9.7	190 9.5	190 9.5	190 9.5	190 9.5	170 8.5
Jordan*	— —	— —	— —	... ...	... ...	... ...	... ...	... ...	... ...	36 1.8	91 4.5	100 5.0	100 5.0	100 5.0
Kuwait†	— —	25 1.2	270 13.4	569 28.3	685 34.1	684 34.1	712 35.5	712 35.5	645 32.1	645 32.1	623 30.9	623 30.9	623 30.9	669 33.3
Lebanon	— —	6 0.3	24 1.2	37 1.8	54 2.7	... ...	53 2.6	53 2.6	53 2.6	52 2.6	52 2.6	52 2.6	52 2.6	17 8.5
Qatar*	— —	— —	— —	... ...	... ...	... ...	... ...	... ...	... ...	13 0.6	13 0.6	12 0.6	63 3.1	56 2.8
Saudi Arabia	— —	140 7.0	189 9.4	465 23.2	537 26.7	630 31.4	586 29.2	487 24.2	487 24.2	487 24.2	487 24.2	705 35.0	860 42.8	840 41.8
Syria	— —	— —	— —	54 2.7	117 5.8	116 5.8	102 5.1	223 11.1	223 11.1	223 11.1	223 11.1	229 11.4	229 11.4	228 11.4
Turkey	— —	1 —	7 0.3	209 10.4	316 15.7	325 16.2	326 16.2	338 16.8	356 17.7	356 17.7	367 18.2	467 23.1	472 23.5	460 22.9
South Yemen	— —	— —	120 6.0	178 8.9	169 8.4	169 8.4	143 7.1	143 7.1	175 8.7	175 8.7	178 8.8	178 8.8	130 6.5	178 8.9
Others	— —	— —	1 —	9 0.4	29 1.4	48 2.4	55 2.7	56 2.8	45 2.2	... ...	... ...	46 2.3	48 2.4	50 2.5
Total	**370** **18.4**	**916** **45.5**	**1,436** **71.4**	**2,686** **133.7**	**3,288** **163.5**	**3,371** **167.9**	**3,506** **174.5**	**3,546** **176.5**	**3,518** **175.0**	**3,731** **185.6**	**3,302** **163.9**	**3,685** **182.9**	**3,901** **194.3**	**4,052** **201.8**
Total, excl. U.S.S.R., China, E. Europe	**6,606** **328.3**	**10,513** **523.0**	**21,140** **1,052.9**	**42,078** **2,094.6**	**59,449** **2,960.1**	**61,680** **3,071.3**	**62,672** **3,120.4**	**63,702** **3,171.8**	**64,375** **3,205.2**	**65,548** **3,263.4**	**65,365** **3,244.7**	**60,729** **3,024.0**	**58,466** **2,902.7**	**57,810** **2,880.5**

***Prior to 1981, included in others. †Includes Neutral Zone.**

U.S.S.R.-EASTERN EUROPE-CHINA

Upper figures = 1,000 b/d
Lower figures = million t/y

	1940	1950	1960	1970	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
China	... —	8 0.4	98 4.9	300 14.9	1,014 50.5	1,398 69.6	1,400 69.7	1,578 78.6	1,600 79.7	1,810 90.1	1,810 90.1	2,000 100.0	2,050 102.1	2,150 107.5
Czechoslovakia	— —	16 0.8	46 2.3	220 11.0	374 18.6	404 20.1	413 20.6	445 22.2	455 22.7	455 22.7	455 22.7	455 22.7	455 22.7	455 22.7
Hungary	— —	20 1.0	58 2.9	130 6.5	223 11.1	230 11.5	226 11.3	230 11.5	290 14.4	312 15.5	312 15.5	311 15.5	312 15.6	242 12.1
Poland	... ...	4 0.2	20 1.0	156 7.8	326 16.2	366 18.2	370 18.4	380 18.9	385 19.2	385 19.2	385 19.2	385 19.2	385 19.2	385 19.2
Romania	... ...	182 9.1	260 12.9	356 17.7	462 23.0	490 24.4	508 25.3	533 26.5	608 30.3	617 30.7	617 30.7	617 30.8	617 30.8	617 30.8
U.S.S.R.	— —	900 44.8	2,800 139.4	5,640 280.9	9,225 459.4	9,500 473.1	9,785 487.3	10,478 521.8	10,950 545.3	11,400 567.6	11,600 575.8	11,750 587.5	12,000 597.6	12,200 610.0
Others	... ...	4 0.2	40 2.0	332 16.5	726 36.1	800 39.8	810 40.3	823 41.0	852 42.4	852 42.4	852 42.4	898 44.7	894 44.5	894 44.5
Total	— —	**1,134** **56.5**	**3,322** [illegible]	**7,134** **355.3**	**12,350** **614.9**	**13,188** **656.7**	**13,512** **672.9**	**14,467** **720.5**	**15,140** **754.0**	**15,831** [illegible]	**16,031** **795.8**	**16,416** **817.4**	**16,671** [illegible]	**16,943** [illegible]
World total	**6,606** **328.3**	**11,647** **579.5**	**24,470** **1,218.3**	**49,212** **2,449.9**	**71,799** **3,575.0**	**74,868** **3,728.0**	**76,184** **3,793.3**	**78,169** **3,892.3**	**79,515** **3,959.2**	**81,379** **4,039.7**	**81,396** **4,040.5**	**77,145** **3,841.5**	**75,137** **3,756.9**	**74,753** **3,737.7**

once, matching vertical to horizontal patterns.

That will mean a half-and-half division of about 2,800 steamflood patterns to be installed in California by the end of the century, or about 400 wells/year. The program will target Kern River, South Belridge, Midway-Sunset, Cymric, and Coalinga fields.

During 1985, Chevron will drill about 400 wells in Kern County, as compared with the 50 it drilled two years ago. And the firm expects to aggressively pursue cogeneration opportunities in California's heavy oil patch.

Getty, Shell maintain level. Getty will drill about 1,200 wells in Kern River field to ensure that production reaches a 100,000 b/d plateau which it should maintain until the end of the decade.

It will drill about 300 true infill wells during 1985, down about 30 from last year. Current Kern River output runs about 96,000 b/d out of a field total of 130,000 b/d. The firm's net increase in the field since 1981 totals about 10,000 b/d of production.

Meanwhile, Shell will drill about 405 infill wells in South Belridge field this year, down from 1984's 670 wells, which made last year the biggest since the peak year of 1981, with 832 wells.

The slowdown is due to Shell nearing the end of initial development. Emphasis will shift to infill drilling and selective steam injection.

Shell Belridge output will peak during 1985-86 at about 105,000 b/d of oil, with perhaps 25,000 b/d of that light oil from the diatomite zone.

Also active in Kern County steamflooding are Mobil Oil Corp. and Santa Fe Energy Co., joined in Midway-Sunset by Getty, Atlantic Richfield Co., and Sun Exploration & Production Co. Other operators with big programs in Kern River are Chevron and Tenneco Oil Co.

Shell also produces about 68,000 b/d of thermal heavy oil from its operations in Coalinga, Kern River, Midway-Sunset, Mount Poso, Ventura, Yorba Linda, and other California fields.

Texaco is also stepping up its Kern River infill/steamflood work.

Phillips Petroleum unit Aminoil Inc. has an ambitious enhanced recovery program under way at Huntington

Where the world's heavy oil is located

Deposit	Resource In place	Recoverable	Reserves
California			
Edna	175	17	
Casmalia	46	23	
McKittrick	841	400	
Oxnard	565	50	
Paris Valley	100	—	
Point Arena	1	—	
Santa Cruz	10	1	
Sisquoc	106	10	
Santa Maria	2,000	200	
Richfield	40	4	
Tri-State area	287	—	
Kentucky			
Asphalt	48	5	
Davis/Dismal Creek	22		
Bee Spring	8		
Kyrock	18		
New Mexico			
Santa Rose	57	5	
Utah			
Asphalt Ridge	873	100	
P.R. Spring	3,700		
Hill Creek	830		
Sunnyside	2,000	500	
Tar Sand Triangle	6,100	1,500	
Circle Cliffs	1,137		
Texas			
Uvalde	2,500	1,250	
Alabama	150		
Producing fields			
Onshore	55,546	25,000	1,754
Alaska		500	
Offshore		500	
Totals	**77,160**	**30,065**	**1,754**
Canada			
Athabaaca			
Mineable	74,000	36,000	1,800
In situ	620,000	72,000	
In between	175,000	0	
Peace River	91,800	9,200	
Wabasca	118,800	12,000	
Cold Lake-Primrosa	270,500	30,000	
Lloydminster	40,000	4,000	800
Melville Island	100	10	
Carbonate Triangle	1,560,000	50,000	
Producing fields			69
Totals	**2,950,200**	**213,340**	**2,669**
Latin America			
Cuba			
Producing fields			2
Mexico			
Producing fields		2,000	329
Totals		**2,000**	**331**
Venezuela			
Orinoco	700,000-3,000,000	500,000	
Guanoco	62	6	
Producing fields			5,421
Trinidad/Tobago			
Pitch Lake	2,000		
Producing fields	700		10
Argentina			
Producing fields			355
Columbia			
Producing fields			41
Peru			
Producing fields	978		100
Totals	**704,440-3,004,440**	**500,006**	**5,927**
Europe			
Albania			
Selenizza	371	4	
Producing fields			[illegible]
Romania			
Derna	25	2	
Producing fields			140
Austria			
Producing fields			4
France			
Producing fields			1

Beach field, including the first U.S. offshore thermal heavy oil recovery project, a steamflood operated from Platform Emmy in state waters off California. The threefold increase of production targeted in the platform steam injection pilot could see expansion later this year.

Although Wilmington megagiant heavy oil field in the Long Beach area doesn't readily lend itself to steamflooding, it's still one of the biggest U.S. oil fields and a number of other EOR projects, including miscible gas, alkaline flood, and CO_2 floods are under way.

CANADA

Alberta boom. Matching the pace of heavy oil action in California is the burgeoning effort in western Canada, notably Alberta, to develop an enormous resource potential in heavy oil, oil sands, and bitumen.

Principal spurs to the accelerating Alberta heavy oil activity are an improving oil export market and removal of the some financial disincentives by a friendly new government.

Faced with an impending budget deficit and declining conventional light oil production and more prone politically to favor business development, the new Conservative government is heeding Alberta's urging to remove some roadblocks to western Canada oil development.

That means a new program to ease restrictions on crude oil exports and allow new Canadian heavy oil, oil sands, and enhanced recovery projects to receive Canada's new $40/bbl international oil reference price. U.S. demand for Canadian heavy oil and bitumen has remained strong, topping 200,000 b/d and likely will reach 300,000 b/d soon.

In addition, Alberta oil producers are getting closer to obtaining their request for placing the tax burden more on profits and less on front end investment, where the onerous taxes often have crippled projects.

The new government economic incentives are encouraging industry in Alerbta and to a lesser extent Saskatchewan, to launch projects aggregating $9

Table 1

Deposit	Resource In place	Recoverable	Reserves
Italy			
Sicily	12,800	500	
Producing fields			350
Other fields		400	
W. Germany			
Producing fields			3
Yugoslavia			
Producing fields			1
Bulgaria			
Producing fields			6
Hungary			
Producing fields			189
Totals	**13,196**	**1,406**	**736**
Africa			
Madagascar			
Bemolanga	21,000	1,000	
Tsimiroco	4,000	200	
Angola			
Producing fields		1	
Gabon			
Producing fields		33	
Nigeria			
Producing fields		55	
Senegal			
Producing fields	700	230	
Benin			
Producing fields			30
Totals	**25,700**	**1,519**	**30**
Middle East			
Iran			
Producing fields	28,600	2,860	1,991
Iraq			
Producing fields	4,000-10,000	500	1,500
Syria			
Producing fields	1,200	120	7
Turkey			
Producing fields	2,000	200	30
Divided Zone			
Producing fields	8,000-12,000	1,000	
Oman			
Producing fields	present	†	
Saudi Arabia			
Producing fields	present	†	
Kuwait			
Producing fields	present		
Totals	**50,000-90,000**	**4,680**	**3,528**
USSR			
Cheildag	24	1	
Melekess	140	7	
Siligir	13	—	
Olenek	10	—	
N. Caspian basin	300	15	
Timan-Pechora basin	50	3	
Lena-Angarsk basin	75	4	
Tungussk	19	1	
Producing fields			10
Indonesia			
Producing fields			44
Japan			
Producing fields			2
Pakistan			
Producing fields			1
Thailand			
Producing fields			40
India			
Producing fields	500		25
Totals	**1,131**	**31**	**122**

Source: U.S. Department of Energy—W.D. Dietzman
U.S. Geological Survey—R.F. Meyer

A look at U.S. heavy oil steam projects

Operator	Field	State	County	Start date	Area, acres	– Number wells –		Total prod. bo/d	Enhanced prod. bo/d
						Prod.	Inj.		
Aminoil	Huntington Beach	Calif.	Orange	6/82	8.3	6	1	280	130
Aminoil	Huntington Beach	Calif.	Orange	10/81	3.5	5	1	100	100
Amoco	Winkleman Dome	Wyo.	Fremont	1964	160	21	15	650	650
ARCO	Midway-Sunset	Calif.	Kern	1/77	5.5	15	4	350	350
ARCO	Midway-Sunset	Calif.	Kern	1/72	4.0	13	1	300	155
ARCO	Midway-Sunset	Calif.	Kern	8/72	3.2	11	1	115	85
ARCO	Midway-Sunset	Calif.	Kern	2/72	31	62	8	1,500	500
ARCO	Kern Front	Calif.	Kern	9/19/77	4.78	9	1	84	29
Burtchaell, E.P.	Blackwell's Corner	Calif.	Kern	1/84	340	25	—	10	600
Champlin	Wilmington	Calif.	Los Angeles	12/82	20	9	4	650	650
Chase	Oxnard	Calif.	Ventura	N/A	1,500	38	—	800	800
Chevron	Bradley Canyon	Calif.	Santa Barbara	4/82	40	16	8	150	100
Chevron	Cymric, Sec. 31X	Calif.	Kern	4/79	61	34	22	1,900	1,800
Chevron	Cymric-36W	Calif.	Kern	5/75	81	105	57	4,000	3,000
Chevron	South Belridge Hill 19	Calif.	Kern	12/83	67	41	27	450	—
Chevron	Kern River Sec. 4	Calif.	Kern	6/78	156	177	62	4,046	3,496
Chevron	McKittrick 9Z	Calif.	Kern	8/78	80	32	16	855	845
Chevron	McKittrick 21Z	Calif.	Kern	—	—	—	—	535	500
Chevron	Kern River MCI	Calif.	Kern	4/76	132	130	62	2,098	1,832
Chevron	Kern River-ANO	Calif.	Kern	5/74	160	102	57	2,369	2,290
Chevron	Kern Front	Calif.	Kern	2/80	36	18	9	350	300
Chevron	West Coalinga, 25-D	Calif.	Fresno	10/78	122	39	22	2,500	2,300
Chevron	West Coalinga, 13-D	Calif.	Fresno	5/73	550	147	89	4,800	4,600
Chevron	N.E. McKittrick, 16-Z	Calif.	Kern	9/75	87	36	22	965	960
Chevron	Kern River, KCL 39	Calif.	Kern	10/75	118	26	45	1,200	1,140
Chevron	Midway-Sunset Sec. 36L	Calif.	Kern	9/80	4	7	3	155	105
Chevron	Midway-Sunset Sec. 26L	Calif.	Kern	11/75	84	75	30	3,000	2,340
Chevron	Midway-Sunset Sec. 1F	Calif.	Kern	2/78	19	20	6	560	450
Chevron	Midway-Sunset Sec. 15A	Calif.	Kern	5/78	23	40	5	1,500	720
Chevron	Kern River Sec. 3	Calif.	Kern	9/68	424	271	108	6,537	6,227
Chevron	Kern River MCII	Calif.	Kern	4/71	80	44	32	1,072	1,047
Chevron	Edison, 27-RT	Calif.	Kern	7/77	30	13	6	621	588
Cities Service	Kern Front (North)	Calif.	Kern	11/81	80	24	—	405	342
Cities Service	Kern Front (South)	Calif.	Kern	8/82	174	—	—	679	543
Conoco	Cat Canyon	Calif.	Santa Barbara	1964	750	150	—	1,500	±800
Conoco	Loco	Okla.	Stephens	2/82	5	4	1	100	85
Conoco	Saner Ranch	Tex.	Maverick	4/81	7.5	6	1	265	265
Conoco	Loco	Okla.	Stephens	6/81	40	15	8	150	100
Drilling & Prod.	Midway-Sunset	Calif.	Kern	1965	160	34	20	140	30
Elf Aquitaine	Poso Creek-MacVan Area	Calif.	Kern	1980	60	32	19	675	—
Exxon	Edison	Calif.	Kern	1965	1,100	—	—	1,000	1,000
Exxon	Edison	Calif.	Kern	2/82	2.5	1	4	—	—
Feldman, D.D.	McKittrick	Calif.	Kern	1/83	10	4	1	25	25
Feldman, D.D.	McKittrick	Calif.	Kern	9/80	80	41	8	525	525
Frasch, R.E.	E. Jasmin	Calif.	Kern	1978	100	6	—	10	10
Getty	Wilcox (Poso Creek)	Calif.	Kern	3/83	69	26	15	675	620
Getty	Midway, Sec. 35	Calif.	Kern	11/8/83	9.5	16	5	515	500
Getty	Kern River	Calif.	Kern	8/62	5,070	3,952	1,871	95,000	95,000
Getty	Cat Canyon	Calif.	Santa Barbara	4/82	30	20	12	530	350
Getty/DOE	Cat Canyon	Calif.	Santa Barbara	4/77	20	9	4	200	200
Getty	Cat Canyon	Calif.	Santa Barbara	1977	390	54	—	2,050	2,050
Getty	Cat Canyon	Calif.	Santa Barbara	1965	300	35	—	350	350
Getty	Cat Canyon	Calif.	Santa Barbara	1964	1,700	151	—	1,500	1,500
Grace	Casmalia	Calif.	Santa Barbara	10/77	63	27	—	300	200
Grace	Arroyo Grande	Calif.	San Luis Obispo	4/77	300	141	—	820	520
Gulf	Fruitvale	Calif.	Kern	5/77	860	122	0	1,500	1,000
Gulf	Tejon-Grapevine	Calif.	Kern	12/78	40	8	0	30	0
Gulf	Lost Hills Sec. 32	Calif.	Kern	2/79	150	29	0	325	250
Gulf	Yorba Linda	Calif.	Kern	7/62	80	84	0	921	921
Gulf	Midway-Sunset	Calif.	Kern	1/78	80	15	0	47	0
Gulf	Cymric	Calif.	Kern	5/66	26	19	0	46	46
Gulf	Kern Bluff	Calif.	Kern	7/76	214	52	0	200	200
Gulf	Lost Hills Sec. 18	Calif.	Kern	7/83	38	34	12	370	370
Gulf	Lost Hills Sec. 30	Calif.	Kern	1/80	190	37	4	240	180
Gulf	Lost Hills Sec. 30	Calif.	Kern	5/77	25	17	3	53	27
Gulf	Lost Hills Sec. 32	Calif.	Kern	4/77	120	30	4	108	43
Marathon	Poso Creek	Calif.	Kern	10/82	309	26	26	700	400
Mobil	Cymric	Calif.	Kern	7/65	175	41	—	260	260
Mobil	S. Belridge	Calif.	Kern	1965	1,850	130	—	800	400
Mobil	N. Midway-Sunset	Calif.	Kern	11/67	374	276	—	4,085	4,085
Mobil	Midway-Sunset	Calif.	Kern	10/70	400	69	—	677	677

Table 2

Operator	Field	State	County	Start date	Area, acres	– Number wells – Prod.	Inj.	Total prod. bo/d	Enhanced prod. bo/d
Mobil	Kern Front	Calif.	Kern	5/74	480	98	—	770	—
Mobil	Edison	Calif.	Kern	12/81	100	25	—	80	70
Mobil	San Ardo	Calif.	Monterey	11/64	110	—	—	—	—
Mobil	S. Belridge	Calif.	Kern	1969	1,050	473	120	16,000	14,500
Mobil	Kern Front	Calif.	Kern	10/82	21	10	4	—	—
Mobil	San Ardo	Calif.	Monterey	6/68	230	75	15	1,750	1,750
Mobil	San Ardo	Calif.	Monterey	3/80	49	24	7	550	550
Phillips	Midway-Sunset	Calif.	Kern	8/78	154	85	—	2,100	2,000
Phillips	McCool Ranch	Calif.	Monterey	11/82	100	3	—	50	40
Phillips	Smackover	Ark.	Ouachita	10/71	985	174	15	1,300	650
Rio Petro	O'Connell Ranch Unit	N.M.	Guadalupe	8/2/81	1.2	5	1	0	0
Rio Petro	T-4 Ranch Unit	N.M.	Guadalupe	10/11/82	1.2	3	1	0	0
Santa Fe	Midway-Sunset	Calif.	Kern	5/65	60	108	25	2,970	2,970
Santa Fe	Midway-Sunset	Calif.	Kern	10/72	5	13	4	55	55
Santa Fe	Midway-Sunset	Calif.	Kern	10/75	33	42	14	418	418
Santa Fe	Kern River	Calif.	Kern	1/81	160	72	65	3,800	3,800
Santa Fe	Midway-Sunset	Calif.	Kern	11/25/81	9.3	10	4	270	30
Santa Fe	Coalinga	Calif.	Fresno	10/78	145	126	41	3,600	600
Santa Fe	Midway-Sunset	Calif.	Kern	3/64	2,400	1,520	—	17,500	17,500
Shell	Kern River-Bishop Lease Pilot	Calif.	Kern	—	12	16	4	320	210
Shell	Kern River-Mecca Lease Pilot	Calif.	Kern	7/80	10	11	4	390	330
Shell	Brea-Olinda	Calif.	Orange	10/66	135	—	—	500	480
Shell	Coalinga, Sec. 15	Calif.	Fresno	11/83	300	6	—	39	—
Shell	Coalinga, Sec. 36	Calif.	Fresno	4/81	80	26	—	300	225
Shell	Kern River	Calif.	Kern	1962	700	362	4	2,600	2,600
Shell	Midway-Sunset	Calif.	Kern	5/81	25	16	—	400	400
Shell	Midway-Sunset	Calif.	Kern	1965	12	30	1,000	350	350
Shell	White Castle	La.	Iberville	8/76	44	7	2	340	340
Shell	White Castle	La.	Iberville	8/76	62	20	8	965	965
Shell	Yorba Linda	Calif.	Orange	1960	220	237	40	3,800	3,800
Shell	South Belridge	Calif.	Kern	1963	4,500	3,022	875	73,000	70,000
Shell	Mt. Poso	Calif.	Kern	9/71	2,350	175	38	20,773	20,220
Shell	Midway-Sunset, National Lease	Calif.	Kern	12/83	62	37	5	800	—
Shell	Midway-Sunset, National Lease	Calif.	Kern	1/81	80	55	5	3,700	2,000
Shell	Midway-Sunset, Cheney-Stimson	Calif.	Kern	11/83	20	25	2	178	—
Shell	Midway-Sunset	Calif.	Kern	5/83	130	142	18	5,300	2,800
Shell	Midway-Sunset	Calif.	Kern	1964	320	360	40	12,500	12,500
Shell	Midway-Sunset	Calif.	Kern	10/83	40	19	7	500	300
Shell	Cat Canyon	Calif.	Santa Barbara	1/25/83	5	1	1	5	5
Shell	Coalinga	Calif.	Fresno	3/83	235	43	—	4,600	4,550
Shell	Coalinga, Sec. 12	Calif.	Fresno	2/82	42	20	10	570	390
Shell	Coalinga, Sec. 29-HX Thermal	Calif.	Fresno	11/81	350	62	7	2,200	1,450
Shell	Kern River	Calif.	Kern	9/81	440	310	112	8,000	8,000
Sun	Cymric (McKittrick Gov't)	Calif.	Kern	12/80	47.5	34	1	1,100	990
Sun	Midway-Sunset (Sec. 15)	Calif.	Kern	5/64	80	111	2	2,600	NA
Sun	Midway-Sunset (Maxwell)	Calif.	Kern	3/64	106.7	181	6	6,400	NA
Sun	Kern River (Kern River Unit)	Calif.	Kern	12/77	50	25	5	280	252
Sun	Midway-Sunset (Band Gov't)	Calif.	Kern	11/82	2.4	4	1	56	56
Sun	Midway-Sunset	Calif.	Kern	8/65	40	73	0	1,900	NA
Sun	Cymric (McKittrick Fee)	Calif.	Kern	9/82	30	19	0	500	470
Texaco	Sour Lake	Tex.	Hardin	11/81	19.8	27	8	720	520
Texaco	Sour Lake	Tex.	Hardin	4/82	1.5	5	1	250	215
Texaco	Humble	Tex.	Harris	11/81	11.8	3	1	17	17
Texaco	E. Cat Canyon	Calif.	Santa Barbara	11/77	30	18	3	200	140
Texaco	San Ardo	Calif.	Monterey	1965	835	305	35	16,000	15,900
Texaco	Midway Sunset	Calif.	Kern	1972	16.6	14	3	450	450
Texaco	Shiells Canyon	Calif.	Ventura	3/73	37	18	2	95	—
Texaco	Labarge	Wyo.	Sublette	10/81	22	12	4	26	0
Texaco	Bird Creek	Okla.	Tulsa	4/81	80	11	—	42	27
Texaco	Sour-Lake	Tex.	Hardin	4/80	264.5	—	—	435	300
Thums/City of Long Beach	Wilmington	Calif.	Los Angeles	1978	193	23	8	1,616	—
Victory	Midway-Sunset	Calif.	Kern	1968	200	117	0	3,000	3,000
Whittier, M.H.	Midway-Sunset	Calif.	Kern	1964	215	N/A	318	6,367	6,367

Survey of operating refineries worldwide

(capacities as of Jan. 1, 1985)

Country	No. plants	Crude, b cd	Catalytic cracking	Catalytic reforming
Abu Dhabi	3	185,250	—	12,334
Algeria	4	464,700	—	55,600
Angola	1	32,100	—	1,900
Argentina	11	678,400	102,500	37,700
Australia	10	696,850	175,500	170,020
Austria	1	273,000	27,000	33,000
Bahamas	1	350,000	—	—
Bahrain	1	250,000	36,000	17,100
Bangladesh	1	31,200	—	1,050
Barbados	1	3,000	—	—
Belgium	5	692,500	100,200	92,420
Bolivia	3	46,930	—	14,158
Brazil	13	1,305,100	315,400	21,600
Brunei	1	9,400	—	—
Burma	2	26,300	—	—
Cameroon	1	43,000	—	6,500
Canada	27	1,868,534	401,767	349,338
Chile	2	141,000	34,000	9,300
China, Taiwan	2	542,510	22,600	56,400
Colombia	4	211,000	91,000	6,000
Congo	1	21,000	—	2,000
Costa Rica	1	15,600	—	1,500
Cyprus	1	16,000	—	3,400
Denmark	3	176,000	—	29,700
Dominican Republic	2	44,000	—	8,300
Ecuador	3	82,282	11,550	2,513
Egypt	6	369,330	—	10,800
El Salvador	1	16,300	—	2,800
Ethiopia	1	14,600	—	1,098
Finland	2	299,000	37,500	48,000
France	17	2,386,000	279,950	310,000
Gabon	1	20,000	—	1,400
Germany	25	2,171,600	179,700	385,850
Ghana	1	28,000	—	5,550
Greece	4	390,000	23,000	30,300
Guam	1	43,700	—	—
Guatemala	1	16,000	—	3,000
Honduras	1	14,000	—	1,800
Hungary	3	241,500	20,000	26,000
India	12	704,752	86,900	26,580
Indonesia	8	630,500	—	60,700
Iran	4	530,000	—	63,845
Iraq	8	318,500	—	43,500
Ireland	1	56,000	—	11,000
Israel	2	170,000	18,000	24,500
Italy	23	3,095,200	279,500	340,400
Ivory Coast	2	60,073	—	14,600
Jamaica	1	35,500	—	3,540
Japan	45	4,813,000	422,650	537,560
Jordan	1	100,000	4,410	8,640
Kenya	1	85,000	—	9,000
Korea	6	776,000	—	36,550
Kuwait	5	668,600	—	51,000
Lebanon	2	17,000	—	3,100
Liberia	1	15,000	—	2,000
Libya	3	329,800	—	14,182
Madagascar	1	16,300	—	2,000
Malaysia	4	205,000	—	20,600
Martinique	1	12,800	—	3,000
Mexico	9	1,289,000	297,000	163,800
Morocco	2	78,700	—	13,058
Mozambique	1	17,000	—	2,500
Netherlands	7	1,498,500	122,500	171,900
Netherlands Antilles	2	740,000	44,000	15,000
New Zealand	1	53,000	—	18,000
Nicaragua	1	15,000	—	3,000
Nigeria	3	250,400	44,100	38,100
Norway	4	244,200	—	29,000
Okinawa	3	153,000	—	11,500
Oman	1	50,000	—	10,000
Pakistan	3	128,750	—	5,800
Panama	1	100,000	—	7,500
Paraguay	1	7,500	—	—
Peru	6	175,560	21,670	1,680
Philippines	3	286,000	16,100	39,400
Portugal	3	289,922	10,086	38,169
Puerto Rico	2	121,000	12,000	5,800
Qatar	1	56,058	—	10,463
Saudi Arabia	4	840,000	10,000	38,000
Senegal	1	20,800	—	2,870
Sierra Leone	1	10,000	—	—
Singapore	5	1,072,000	—	50,000
Somalia	1	10,000	—	—
South Africa	5	388,500	80,000	62,500
Spain	10	1,483,000	103,500	179,700
Sri Lanka	1	50,000	—	3,750
Sudan	1	22,800	—	1,700
Sweden	6	438,000	24,000	73,580
Switzerland	2	127,000	—	25,000
Syria	2	228,790	—	10,348
Tanzania	1	13,520	—	3,000
Thailand	3	171,800	8,000	24,600
Togo	1	20,000	—	4,400
Trinidad	2	320,000	25,000	27,000
Tunisia	1	34,000	—	3,300
Turkey	4	460,475	38,600	45,057
United Kingdom	16	2,007,700	356,500	349,500
Uruguay	1	45,000	5,000	3,000
Venezuela	7	1,224,200	179,400	6,000
Virgin Islands	1	545,000	—	125,000
Yemen, S.	1	178,000	—	12,000
Yugoslavia	7	296,667	1,960	45,156
Zaire	1	17,000	—	3,000
Zambia	1	24,500	—	5,000
Total	438	42,465,959	4,098,502	4,734,140

Country-by-country refining survey

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
ABU DHABI			
Abu Dhabi National Oil Co.–Ruwais	114,300	—	
Umm Al Nar—1	14,250	—	[4]2,520
Umm Al Nar—2	57,000	—	[3]9,814
Total	185,550	—	12,334
ALBANIA			
Government-owned refineries at Ballsh, Cerrik, Stalin			
Total	40,000		
ALGERIA			
Sonatrach: Arzew	60,000	—	8,000
Hassi Messaoud	23,700	—	2,000
Maison Carree	58,000	—	15,000
Skikda	323,000	—	30,000
Total	464,700	—	55,000
ANGOLA			
Petrangol SARL–Luanda	32,100	—	[1]1,900
ARGENTINA			
Destileria Argentina de Petroleo SA–Lomas de Zamora	2,000	—	—
Esso SAPA–Campana	93,400	[1]22,500	[1]7,700
Galvan	17,000	—	—
Isaura SA–Bahia Blanca	12,000	—	—
Shell Cia. Argentina de Petroleo SA–Buenos Aires	115,000	19,000	9,500
Yacimientos Petroliferos Fiscales–Campo Duran	32,000	—	—
Dock Sud	4,000	—	—
La Plata	216,000	[1]45,000	[1]9,000
Lujan de Cuyo	129,000	[1]16,000	[1]9,000
Plaza Huincul	23,000	—	[1]2,500
San Lorenzo	35,000	—	—
Total	678,400	102,500	37,700
AUSTRALIA			
Ampol Refineries Ltd.–Lytton	71,250	[1]23,400	[1]11,700
Australian Oil Refinery PL–Kurnell	100,000	[1]39,000	[1]25,600
Australian Lubricating Oil Refinery Ltd.–Kurnell	—	—	—
BP Australia–Brisbane	42,000	[1]12,800	[1]8,500
Kwinana	100,000	[1]26,300	[1]3,000 [1]13,000
Westernport	57,000	—	[1]16,000
Marange Oil & Refining Co.–Roma, Queensland	500	—	[1]220
Mobil Oil Australia Ltd.–Adelaide	—	—	—
Petroleum Refineries Australia PL–Adelaide	46,500	—	[1]16,000
Altona	98,600	[1]24,000	[1]28,000
Shell Refining (Australia) PL.–Clyde	69,000	25,000	18,000
Geelong	112,000	[1]25,000	30,000
Total	696,850	175,500	170,020

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
AUSTRIA			
OeMV–Schwechat	273,000	[1]27,000	[1]19,000
BAHAMAS			
Bahamas Oil Refining Co.–Freeport	500,000	—	—
BAHRAIN			
Bahrain Petroleum Co. BSC (Closed)–Sitra	250,000	[1]38,000	[1]17,100
BANGLADESH			
Eastern Refinery Ltd.–Chittagong	31,200	—	[1]1,000
BARBADOS			
Mobil Oil Barbados Ltd.–Bridgetown	3,000	—	—
BELGIUM			
Belgian Refining Corp. NV–Antwerp	108,500	—	[1]12,000
Belgian Shell NV–Ghent	6,600	—	—
Belgische Petroleum Raffinaderij NV–Antwerp	75,400	—	[1]20,520
SA Esso NV–Antwerp	194,000	[1]24,700	[1]29,700
SIBP NV–Antwerp	308,000	[1]75,500	[1]30,200
Total	692,500	100,200	92,420
BOLIVIA			
Yacimientos Petroliferos Fiscales Bolivianos–Cochabamba	27,500	—	[1]7,750
Santa Cruz	16,430	—	[1]6,400
Sucre	3,000	—	—
Total	46,930	—	14,150
BRAZIL			
Petroleo Brasileiro SA: Araucária, Paraná	144,800	[1]45,500	—
Betim, Minas Gerais	120,600	[1]30,400	—
Canoas, Rio Grande do Sul	63,300	[1]13,600	—
Cubatão, São Paulo	127,300	[1]48,300	[1]10,200
Duque de Caxias, Rio de Janeiro	221,300	[1]39,600	[1]11,400
Fortaleza, Ceará	4,200	—	—
Manaus, Amazonas	8,400	[1]1,800	—
Mataripe, Bahia	122,400	[1]25,000	—
Mauá, Santo André, São Paulo	27,200	[1]14,400	—
Paulínia, São Paulo	289,500	[1]39,800	—
São José dos Campos, São Paulo	156,800	[1]54,300	—
Refinaria de Petróleo Ipiranga SA–Rio Grande do Sul	9,300	[1]2,500	—
Refinaria de Petroleos de Manguinhos SA–Rio de Janeiro	10,000	—	—
Total	1,305,100	315,400	21,600
BRUNEI			
Brunei Shell Petroleum CL–Seria	9,400	—	—

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
BULGARIA			
Government-owned refineries at Burgas, Pleven, Ruse.			
Total	**300,000**		
BURMA			
Petrochemical Industries Corp.–Chauk	6,300	....	....
Syriam	20,000	....	....
Total	**26,300**	....	....
CAMEROON			
Sonara-National Refining Co.–Cape Limboh, Limbe	**43,000**	....	**[2]6,500**
CANADA			
Alberta			
Gulf Canada Products Co.–Edmonton	121,000	....	[2]13,100
Husky Oil Operations Ltd.–Lloydminster	23,500	....	....
Imperial Oil Ltd.–Edmonton	177,100	[1]48,500	[4]21,300
Shell Canada Ltd.–Bowden	....	....	2,600
Scotford	50,000	....	....
Turbo Resources Ltd.–Balzac	27,534	[1]8,820	[2]7,544
Total	**399,134**	**57,320**	**44,544**
British Columbia			
Chevron Canada Ltd.–North Burnaby	35,000	[1]13,000	[2]11,700
Gulf Canada Products Co.–Port Moody	37,200	[1]12,300	[2]8,600
Imperial Oil Ltd.–Ioco	40,900		[4]1,200
Petro-Canada Products Inc.–Taylor	19,000	[1]6,250	[2]2,950
Shell Canada Ltd.–Shellburn, Burnaby	24,000	[1]6,100	3,800
Total	**165,600**	**53,287**	**35,494**
New Brunswick			
Irving Oil Ltd.–St. John	237,500	[1]17,100	[2]34,650
Total	**237,500**	**17,100**	**34,650**
Northwest Territories			
Imperial Oil Ltd.–Norman Wells	**2,900**		
Nova Scotia			
Imperial Oil Ltd.–Dartmouth	84,000	[1]23,300	[4]8,700
Texaco Canada Ltd.–Halifax	20,000	[1]7,200	[2]3,600
Total	**104,000**	**30,500**	**12,300**
Ontario			
Gulf Canada Products Co.–Clarkson	60,000	[1]18,400	[2]8,700 [6]8,800
Imperial Oil Ltd.–Sarnia	126,100	[1]23,300	[2]16,500 [4]13,600
Petro-Canada Products Inc.–Oakville	80,000	[2]23,000	[1]5,000
Shell Canada Ltd.–Sarnia	71,000	[1]17,000	23,000
Sun Oil–Sarnia	90,000	[3]16,200	[2]25,650
Texaco Canada Ltd.–Nanticoke	95,000	[1]40,000	[2]24,000
Total	**522,100**	**137,900**	**136,650**
Quebec			
Gulf Canada Products Co.–Montreal[7]	74,000	[1]22,100	[2]8,600
Petro-Canada Products Inc.–Montreal	90,000	[2]18,000	[2]30,500
Shell Canada Ltd.–Montreal	120,000	[1]22,560	[6]23,000
Ultramar Canada Inc.–St. Romuald	100,000	[1]30,000	[2]14,600
Total	**384,000**	**92,660**	**76,700**
Saskatchewan			
Consumer's Cooperative Refineries Ltd.–Regina	40,000	[1]13,000	[1]9,000
Gulf Canada Products Co.–Moose Jaw	13,300	....	....
Total	**53,300**	**13,000**	**9,000**
Total Canada	**1,868,534**	**401,767**	**349,338**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
CHILE			
Petrox SA–Concepción	72,000	[1]20,000	[1]4,000
Refineria de Concon–Concon	69,000	[1]14,000	[1]5,300
Total	**141,000**	**34,000**	**9,300**
CHINA			
Government-owned refineries at Anshan, Beijing, Dalian, Daqing, Fushun, Hangzhou, Jinxi, Karamai-Dushanzi, Lanchow, Lenghu, Maoming, Nanchong, Nanjing, Shanghai, Shengli, Tianjin, Yumen.			
Total	**2,050,000**		
CHINA, TAIWAN			
Chinese Petroleum Corp.–Kaohsiung	425,000	[1]22,600	[2]18,080 [6]18,080
Tao-Yuan	117,510	....	[2]20,240
Total	**542,510**	**22,600**	**56,400**
COLOMBIA			
Empresa Colombiana de Petroleos –Barrancabermeja-Santander[1]	135,000	[1]52,000	[2]6,000
Cartagena, Bolivar	70,000	[1]29,000	....
Orito, Putumayo	1,000	....	....
Tibu, N. de Santander	5,000	....	....
Total	**211,000**	**91,000**	**6,000**
CONGO			
Coraf–Pointe-Noire	**21,000**	....	**[2]2,000**
COSTA RICA			
Refinadora Costarricense de Petroleo SA–Limon	**15,600**	....	**[1]1,500**
CUBA			
Government-owned refineries at Cabaiguan, Havana, Santiago de Cuba.			
Total	**160,000**		
CYPRUS			
Cyprus Petroleum Refinery Ltd.–Larnaca	**16,000**	....	**[4]3,400**
CZECHOSLOVAKIA			
Government owned refineries at Bratislava, Kolin, Kralupi, Pardubice, Strazke, Zaluzi, Zyolen.			
Total	**455,000**		
DENMARK			
AS Dansk Shell–Fredericia	56,000	....	11,000
Dansk Esso AS–Kalundborg	68,000	....	[2]8,400
Kuwait Petroleum Refining (Danmark) A/S–Skaelskor	52,000	....	[2]10,300
Total	**176,000**	....	**29,700**
DOMINICAN REPUBLIC			
Falconbridge Dominicana C por A–La Peguera	16,000	....	....
Refineria Dominicana de Petroleo SA–Nigua	28,000	....	8,300
Total	**44,000**	....	**8,300**
ECUADOR			
CEPE–Esmeraldas	50,282	[1]11,550	[2]2,513
Anglo Ecuadorian Oilfields Ltd.–Sta. Elena Peninsula	31,000	....	....
Texaco–Lago-Agrio	1,000	....	....
Total	**82,282**	**11,550**	**2,513**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
EGYPT			
Alexandria Petroleum Co.–Alexandria (El-Mex)	105,000	....	....
El Nasr Petroleum Co.–Alexandria (El-Ameria)	67,500	....	....
Suez	70,830	....	....
Suez Oil Processing Co.–Mostorod	84,150	....	[2]10,800
Suez	18,900	....	....
Tanta	22,950	....	....
Total	**369,330**	....	**10,800**
El SALVADOR			
Refineria Petrolera Acajutla SA–Acajutla	**16,300**	....	**[1]2,800**
ETHIOPIA			
Ethiopian Petroleum Corp.–Assab	**14,600**	....	**[2]1,800**
FINLAND			
Neste Oy–Naantali	56,000	[2]9,500	....
Porvoo	243,000	[1]28,000	[1]20,000 [2]28,000
Total	**299,000**	**37,500**	**48,000**
FRANCE			
Cie. Francaise de Raffinage–Gonfreville L'Orcher	315,000	[1]30,250	[2]46,000
La Mede	136,000	[1]30,000	[2]23,400
Mardyck	128,000	[1]23,000	[2]20,500
Cie. Rhenane de Raffinage–Reichstett-Vendenheim	86,000	[1]11,000	12,000
Elf France–Ambes	....	[1]6,300	....
Donges	214,000	[1]31,000	[4]30,000
Feyzin	185,000	[1]16,000	[2]10,000
Grandpuits	100,000	[1]22,000	[2]15,000
Esso SAF–Fos sur Mer	161,000	[1]16,400	[2]25,700
Port Jerome	161,000	[1]20,000	[2]16,000
Mobil Oil Francaise–Frontignon	82,000	[2]17,000	[2]20,000
Notre Dame de Gravenchon	57,000	....	[2]17,000
Shell Francaise–Berre l'Etang	210,000	19,000	15,000
Pauillac	92,000	[1]19,000	13,000
Petit Couronne	285,000	[1]19,000	41,000
Ste. Francaise des Petroles BP–Dunkirk	....	....	....
Lavera	174,000	....	[1]5,400
Total	**2,386,000**	**279,950**	**310,000**
GABON			
Ste. Gabonaise de Raffinage–Port Gentil	**20,000**	....	**1,400**
GERMANY, EAST			
Government-owned	**470,000**		
GERMANY, WEST			
Deutsche BP AG–Finkenwerder, Hamburg (imported feedstocks)	....	....	[1]7,650
Vohburg	97,000	[1]15,200	[2]15,200
Deutsche Marathon Petroleum GmbH–Burghausen	70,000	....	....
Deutsche Shell AG–Godorf	170,000	....	38,000
Harburg-Grasbrook	86,000	[1]12,000	15,000
Monheim	8,000	....	....
Deutsche Texaco AG–Heide	104,000	[2]9,000	[6]18,000
Elf Bitumenwerke GmbH–Brunsbuettel	7,500	....	....
Erdol Raffinerie Duisburg GmbH–Duisburg	37,800	....	[2]7,300
Erdolraffinerie Ingolstadt AG–Ingolstadt, Donau	90,000	....	[2]30,000
Erdoel Raffinerie Neustadt GmbH–Neustadt-Donau	144,000	[1]22,700	[1]17,700
Esso AG–Hamburg	110,000	[1]14,000	[2]12,800
Ingolstadt	100,000	[1]19,800	[2]12,800
Karlsruhe	160,000	....	[2]27,900
Gewerkschaft Erdol-Raffinerie Deurag-Nerag–Misburg	45,000	....	

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
Mobil Oil AG–Wilhelmshaven	160,000	....	[2]32,000
Worth	75,000	[1]15,000	[2]14,000
Oberrheinische Mineralolwerke GmbH–Karlsruhe	142,000	[1]66,000	[2]11,400
Oelwerke Julius Schindler GmbH–Hamburg	9,300	....	....
Ruhr Oel GmbH–Gelsenkirchen	215,400	[1]6,000	[1]11,900
Saarland-Raffinerie GmbH–Volklingen	78,000	....	....
Union Rheinische Braunkohlen Kraftstoff AG–Wesseling	95,000	....	[2]9,000
Wintershall AG–Lingen	91,400	....	[1]7,400
Mannheim	71,100	....	[2]18,400
Salzbergen	5,100	....	....
Total	**2,171,600**	**179,700**	**385,850**
GHANA			
Ghanaian Italian Petroleum CL–Tema	**28,000**	....	**[1]5,550**
GREECE			
Hellenic Aspropyrgos Refinery SA–Aspropyrgos	110,000	....	[1]5,200 [2]9,500
Motor Oil (Helias) Corinth Refineries SA–Aghii Theodori	100,000	[1]23,000	[1]8,500
Petrola Hellas SA–Elefsis	108,000	....	....
Thessaloniki Refining Co. AE–Thessaloniki	72,000	....	[2]7,100
Total	**390,000**	**23,000**	**30,300**
GUAM			
Guam Oil & Refining Co.–Apra Heights	**43,700**	....	....
GUATEMALA			
Texas Petroleum Co.–Escuintla	**16,000**	....	**[2]3,000**
HONDURAS			
Refineria Texas de Honduras SA–Puerto Cortes	**14,000**	....	**[1]1,800**
HUNGARY			
Dunai KV–Százhalombatta	165,000	20,000	[4]26,000
Tiszai KV–Leninváros	66,500	....	....
Zalai KV–Zalaegerszeg	10,000	....	....
Total	**241,500**	**20,000**	**26,000**
INDIA			
Bharat Petroleum CL–Mahul, Bombay	105,432	[1]17,000	7,000
Bongaigaon Refinery & Petrochemicals Ltd.–Bongaigaon, Assam	21,400	[1]1,930	....
Cochin Refineries Ltd.–Kerala	66,000	....	[5]5,660
Hindustan Petroleum CL–Mahul, Bombay	90,000	[1]9,000	....
Visakhapatnam	30,000	[1]7,600	....
Indian Oil CL–Barauni	66,000	....	....
Digboi	10,050	....	....
Gauhati	16,400	....	....
Gujarat	14,770	[1]19,800	7,000
Haldia	50,000	[1]19,800	4,500
Mathura	120,000	....	....
Madras Refineries Ltd.–Madras	114,700 [3]3,000	[1]11,770	[1]2,400
Total	**704,752**	**86,900**	**26,560**
INDONESIA			
Lemigas–Cepu, Central Java	1,000	....	....
Pertamina–Balikpapan, Kalimantan	230,500	....	[6]18,000
Cilacap, Central Java	270,000	....	[6]29,100
Dumai, Central Sumatra	90,000	....	[2]5,600 [5]8,000
Pangakalan Brandan, North Sumatra	4,000	....	....
Sungai Pakning, Central Sumatra	35,000	....	....
Total	**630,500**	....	**60,700**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
IRAN			
National Iranian Oil Co.–Esfahan	200,000	....	29,600
Shiraz	40,000	....	6,245
Tabriz	80,000	....	....
Tehran	210,000	....	28,000
Total	**530,000**	....	**63,845**

Note: Present status uncertain due to Iran-Iraq war.

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
IRAQ			
Oil Refineries Administration–Baiji	150,000	....	22,000 16,500
Basra	70,000	....	....
Daura	71,000	....	5,000
K3-Haditha	7,000	....	....
Khanaqin	12,000	....	....
Mufthia	4,500	....	....
Qaiyarah, Mosul	2,000	....	....
Iraqi Company for Oil Operations–Kirkuk	2,000	....	....
Total	**318,500**	....	**43,500**

Note: Present status uncertain due to Iran-Iraq war.

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
IRELAND			
Irish Refining CL–Whitegate	**56,000**	....	**[2]11,000**
ISRAEL			
Oil Refineries Ltd.–Ashdod	70,000	....	[2]10,000
Haifa	100,000	[1]18,000	[2]14,500
Total	**170,000**	**18,000**	**24,500**
ITALY			
ANIC SpA–Gela	80,000	[1]27,000	[2]10,000
Anonima Petroli Italiana–Falconara	83,000		[2]11,000
Aquila SpA–Trieste	110,000	....	15,000
ERG SpA–Genoa, San Quirico	130,000	....	[4]10,500
Esso Italiana SpA–Augusta, Siracusa	198,000	[1]45,300	[1]9,300 [4]7,300
Industrie Chimiche Italiane de Petrolio SpA–Frassino, Mantovano	55,000	....	9,500
Industria Italiana Petroli–Rho	79,800	[2]13,700	[2]16,000
Taranto	90,900	....	[2]16,000
Iplom SpA–Busalla	46,500	....	....
Irom–Industria Raffinazione Oli Minerali–Porto Marghera	108,000	....	[2]16,000
ISAB–Melilli	220,000	....	[4]34,500
Lombarda Petroli SpA–Villasanta	23,500	....	[6]4,000
Mediterranea SpA–Milazzo	145,000	[1]40,000	[3]10,000
Mobil Oil Italiana SpA–Naples	100,000	[2]18,400	[2]12,500
Montedipe SpA–Priolo, Siracusa	300,000	[1]30,000	[1]10,000
Raffineria del Po SpA–Sannazaro de Burgondi	230,000	[1]27,000	[2]10,500
Raffineria di Roma SpA–Rome	91,200	....	[2]15,100
Saras SpA–Sarroch	324,000	[1]63,000	[4]13,000 [6]27,000
Sarom–Ravenna	200,000	....	[2]10,000
Sarpom–Trecate, Novara	244,100	[1]15,100	[2]18,900 [6]8,300
Soc. Petrolifera Italiana–Arcola, La Spezia	25,000	....	....
Stanic–Livorno	111,200	....	[2]19,500
Tamoil Italia SpA–Cremona	100,000	....	[1]3,800
Total	**3,895,200**	**279,500**	**340,400**
IVORY COAST			
Ste. Ivoirienne de Raffinage–Abidjan	80,000	....	[2]14,600
Ste. Multinationale de Bitumes–Abidjan	10,075	....	....
Total	**90,073**	....	**14,600**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
JAMAICA			
Petrojam Ltd.–Kingston	**35,500**	....	**[1]3,540**
JAPAN			
Asia Kyoseki CL–Sakaide, Kagawa	135,000	[1]13,500	[2]9,000
Asia Oil CL–Hakodate	22,500	....	[2]1,170
Yokohama, Kanagawa	90,000	....	[2]12,600
Cosmo Oil CL–Chiba	209,000	[1]23,400	[2]22,500
Sakai	104,500	[1]17,550	[2]6,300
Yokkaichi City	166,250	[1]18,000	[2]5,400 [4]7,200
Fuji Kosan Oil CL–Kainan	77,600	....	....
Fuji Oil CL–Sodegaura	153,700	[1]10,800	[2]13,600
General Sekiyu Seisei KK–Kawasaki	40,500	....	[1]7,900
Sakai	108,000	....	[1]23,300
Idemitsu Kosan CL–Chita, Aichi	123,500	....	[2]16,200
Himeji, Hyogo	104,500	....	[2]13,500
Ichihara, Chiba	199,500	[1]37,000	[2]15,300
Tokuyama, Yamaguchi	95,000	[1]20,700	[2]10,800
Tomakomai, Hokkaido	66,500	....	[2]9,900
Kashima Oil CL–Kashima, Ibaragi	150,000	[1]14,000	[4]12,500
Koa Oil CL–Marifu	125,100	[1]12,600	[2]8,730
Osaka	72,000	[1]16,200	[2]8,100
Kyokuto Petroleum Ltd.–Chiba	143,000	....	[2]14,500
Kyushu Oil CL–Oita	170,000	[1]15,000	[2]8,000
Maruzen Oil CL–Matsuyama	....	....	[1]4,050
Shimotsu	....	....	....
Mitsubishi Oil CL–Kawasaki	75,000	....	[2]15,000
Mizushima	220,000	[1]30,000	[2]30,100
Nichimo Sekiyu Seisei KK–Kawasaki	72,000	....	[1]7,400
Nihonkai Oil CL–Toyama	60,000	....	....
Nippon Mining CL–Chita	100,000	....	[1]22,000
Funakawa	14,150	....	....
Mizushima	235,200	[1]30,000	[1]23,000
Nippon Oil CL–Niigata	28,000	....	[2]5,100
Nippon Petroleum Refining CL–Kudamatsu	22,000	....	[2]3,300
Muroran	125,000	[1]16,000	[2]18,000
Negishi	330,000	[1]32,000	[2]31,000
Yokohama	55,000	[1]5,600	[2]3,300
Seibu Sekiyu KK–Onoda	134,000	....	17,000
Showa Sekiyu KK–Kawasaki	135,000	....	20,000
Niigata	30,000	....	4,400
Showa Yokkaichi Sekiyu KK–Yokkaichi	207,000	15,000	23,000
Taiyo Oil CL–Ehime	65,000	....	[2]5,000
Toa Nenryo Kogyo–Kawasaki	180,000	[1]63,700	[1]14,900
Shimizu	27,000	....	[1]8,800
Wakayama	153,900	[1]31,600	[1]33,000
Toa Oil CL–Kawasaki	65,000	....	[2]11,000
Toho Oil CL–Owase	40,000	....	....
Tohoku Oil CL–Sendai	83,600	....	[2]11,700
Total	**4,813,000**	**422,650**	**537,550**
JORDAN			
Jordan Petroleum Refinery–Zerka	**100,000**	**[2]4,410**	**[2]8,640**
KENYA			
Kenya Petroleum Refineries Ltd.–Mombasa	**95,000**	....	**[1]9,000**
KOREA, N.			
Government-owned, Unggi	**42,000**		
KOREA, S.			
Honam Oil Refinery CL–Yosu	355,000	....	[1]15,300
Kukdong Oil CL–Busan[1]	10,000	....	....
Kyung In Energy CL–Inchon	60,000	....	[2]3,600
Modern Petroleum CL–Busan	2,000	....	....
Ssangyong Oil Refining CL–Onsan	84,000	....	....
Yukong Ltd.–Ulsan	265,000	....	[2]17,650
Total	**776,000**	....	**36,550**
KUWAIT			
Arabian Oil CL–Ras Al Khafji	30,000	....	....
Getty Oil Co. (subsidiary of Texaco Inc.)–Mina Al-Zour	50,000	....	....
Kuwait National Petroleum Co.–Mina Abdulla	70,600	....	....
Mina Al-Ahmadi	323,000	....	[2]36,000
Shuaiba	195,000	....	[2]15,000
Total	**668,600**	....	**51,000**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
LEBANON			
Tripoli Oil Installations†–Tripoli	35,000	[1]7,250	4,392
Mediterranean Refining Co.–Sidon	17,000	—	[1]3,100
Total	**17,000**	—	**3,100**

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†Current status incomplete. Not included in totals.

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
LIBERIA			
Liberia Petroleum Refining–Monrovia	**15,000**	—	**[1]2,000**
LIBYA			
Azzawiya Oil Refining Co.–Azzawiya	120,000		[2]12,982
Ras Lanuf Oil & Gas Processing Co.–Ras Lanuf	201,000		
Sirte Oil Co.–Brega	8,800	—	[1]1,200
Total	**329,800**	—	**14,182**
MADAGASCAR			
Solima-Managareza, Tamatave	**16,350**	—	**[1]2,000**
MALAYSIA			
Esso Malaysia Berhad–Port Dickson	40,000		[1]6,600
Petronas Penapisan Sdn. Berhad–Kerteh, Kemaman, Terengganu	30,000	—	
Sarawak Shell Berhad–Luton	45,000	—	—
Shell Refining Co. Berhad–Port Dickson	90,000	—	14,000
Total	**205,000**	—	**20,600**
MARTINIQUE			
Ste. Anonyme de la Raffinerie des Antilles–Fort-de-France	**12,000**	—	**[2]3,000**
MEXICO			
Petroleos Mexicanos–Azcapotzalco	105,000	[1]23,300	
Cadereyta	235,000	[1]40,000	[4]20,000
Ciudad Madero	185,000	[1]51,000 [3]9,000	[4]15,000
Minatitlan	199,000	[1]24,000 [2]21,000	[5]54,000
Poza Rica	16,000		—
Reynosa	9,000		
Salamanca	200,000	[1]40,000 [2]18,000	[5]24,800
Salina Cruz	170,000		
Tula, Hidalgo	150,000	[1]40,000	[5]30,000
Total	**1,269,000**	**297,000**	**163,800**
MOROCCO			
Samir–Mohammedia	55,703	—	[4]10,935
Ste. Cherifienne des Petroles–Sidi Kacem	24,000	—	[2]2,123
Total	**79,703**	—	**13,058**
MOZAMBIQUE			
Petromoc EE–Matola-Lingamo	**17,090**	—	**[1]2,500**
NETHERLANDS			
BP Raffinaderij Nederland NV–Rotterdam	437,000	[1]47,500	[2]27,000
Chevron Petroleum Mij. (Nederland) BV†–Pernis	207,000	—	[2]29,000
Esso Nederland BV–Rotterdam	185,000	—	[1]20,700
Kuwait Petroleum Europoort BV–Europoort	75,500	—	[2]8,200
Shell Nederland Raffinaderij BV–Pernis	436,000	[3]6,800 [1]75,000	45,000
Smid & Hollander Raffinaderij BV–Amsterdam	8,000	—	—
Total Raffinaderij Nederland NV–Vlissingen	150,000	—	[2]14,000
Total	**1,498,500**	**122,500**	**171,900**

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†Wholly owned by Texaco Inc.

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
NETHERLANDS ANTILLES			
Lago Oil & Transport CL–Aruba	420,000		
Shell Curacao NV–Curacao	320,000	44,000	15,000
Total	**740,000**	**44,000**	**15,000**
NEW ZEALAND			
New Zealand Refining–Whangarei	**53,000**	—	**10,000**
NICARAGUA			
Esso Standard SA Ltd.–Managua	**15,000**	—	**[1]3,000**
NIGERIA			
Nigerian Petroleum Refining CL–Kaduna	90,400	[1]18,100	[1]15,400
Port Harcourt, Alesa Eleme	60,000	—	[1]6,000
Warri	100,000	[1]26,000	[2]16,700
Total	**250,400**	**44,100**	**38,100**
NORWAY			
AS Norske Esso–Slagentangen Valloy	90,000 4,200	—	[2]9,000 —
AS Norske Shell–Sola	60,000	—	10,000
Rafinor AS–Mongstad	90,000	—	[2]10,000
Total	**244,200**	—	**29,000**
OKINAWA			
Nansei Sekiyu KK–Nishihara	45,000	—	[1]9,500
Nippon Petroleum Refining CL–Nakagusuku	8,000	—	[4]2,000
Okinawa Sekiyu Seisei–Yonashiro	100,000	—	—
Total	**153,000**	—	**11,500**
OMAN			
Oman Refinery Co.–Mina Al Fahal	**40,002**	—	**[2]9,644**
PAKISTAN			
Attock Refinery Ltd.–Rawalpindi	36,000	—	—
National Refinery Ltd.–Korangi, Karachi	47,750	—	[2]2,750
Pakistan Refinery Ltd.–Karachi	45,000	—	[1]2,850
Total	**128,750**	—	**5,600**
PANAMA			
Refineria Panama SA–Las Minas	**100,000**	—	**[2]7,500**
PARAGUAY			
Petroleos Paraguayos–Villa Elisa	**7,500**	—	—
PERU			
Petroleos del Peru:			
Conchan	6,290	—	—
Iquitos, Loreto	9,860	—	
La Pampilla, Lima	93,900	[1]6,230	[2]1,680
Marsella, Loreto	2,040	—	—
Pucallpa	2,440	—	—
Talara	61,030	[1]15,440	—
Total	**175,560**	**21,670**	**1,600**
PHILIPPINES			
Bataan Refining Corp.–Limay	155,000	[2]8,000	[1]23,000
Caltex (Philippines) Inc.–Batangas	63,000	[2]10,800	—
Pilipinas Shell Petroleum–Tabangao	68,000	—	8,300
Total	**286,000**	**16,100**	**30,400**

POLAND

Government-owned refineries at Czechowice, Gdansk, Glinik Mariampolski, Jasto, Jealicze, Kralaty, L. Warynski, Plock, Trzebinia. Of these, Plock is by far the largest, accounting for roughly 80% of Polish refinery production. Its crude capacity is nearly 300,000 b/d.

	Crude		
Total	**305,000**		

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
PORTUGAL			
Petrogal–Lisbon	....	[2]10,096	....
Leça da Palmeira, Porto	89,100	....	[6]10,669
Sines	200,822	....	[6]27,500
Total	**289,922**	**10,096**	**38,169**
PUERTO RICO			
Caribbean Gulf Refining Corp– Bayamón	36,000	[1]12,000	[2]5,800
Yabucoa Sun Oil Co.–Yabucoa	85,000	....	....
Total	**121,000**	**12,000**	**5,800**
QATAR			
National Oil Distribution Co.– Umm Said	56,058	....	[2]1,576 [4]8,887
Total	**56,058**	....	**10,463**
RUMANIA			
Government-owned refineries at Bacau, Borzesti, Brazi, Brazov, Cimpina, Darmanesti, G. Gheorghiu Dej, Navodari, Onesti, Pitesti, Ploesti, Sulpacu, and Telaejen.			
Total	**617,000**		
SAUDI ARABIA			
Arabian American Oil Co.– Ras Tanura	450,000	....	....
Jeddah Oil Refinery–Jeddah	90,000	[1]10,000	[1]3,000
Riyadh Oil Refinery–Riyadh	130,000	....	....
Yanbu Domestic Refinery–Yanbu	170,000	....	[2]35,000
Total	**840,000**	**10,000**	**38,000**
SENEGAL			
Ste. Africaine de Raffinage– M'Bao (Dakar)	**29,800**	....	**[4]2,870**
SIERRA LEONE			
Sierra Leone Petroleum Refining Co.–Freetown	**10,000**	....	...
SINGAPORE			
BP Refinery Singapore PL Pasir Panjang	28,000	....	....
Esso Singapore PL–Pulau Ayer Chawan	230,000	....	[1]9,000
Mobil Oil Singapore PL–Jurong	193,000	....	[1]3,000
Shell Eastern Petroleum Ltd.– Pulau Bukom	460,000	....	17,000
Singapore Refinery CPL†– Pulau Merlimau	161,000	....	[4]11,000
Total	**1,072,000**	....	**50,000**
†Singapore Petroleum CPL shares percentages of refinery capacities.			
SOMALIA			
Iraqsoma Ref. Co.–Mogadishu	**10,000**	....	....
SOUTH AFRICA			
Caltex Oil SA PL–Cape Town	90,000	[1]25,000	[2]10,500
Mobil Oil Refining Co.– Southern Africa PL–Durban	65,000	[1]15,000	[2]19,000
†Durban	....	....	....
National Petroleum Refiners of South Africa PL–Sasolburg OFS	78,500	[1]16,000	[2]12,000
Shell and BP South Africa Petroleum Refineries PL–Durban	155,000	[1]24,000	[2]21,000
Total	**388,500**	**80,000**	**52,500**
†South African Oil Refinery PL is owner; Mobil is operator.			
SPAIN			
Asfaltos Españoles SA–Tarragona	21,000	....	....
Cia. Española de Petróles–San Roque (Cádiz)	176,000	[1]25,000	[2]35,000
Tenerife	176,000	....	[2]19,000
Cia. Ibérica Refinadora de Petroleos–La Coruña	140,000	[1]25,000 [5]13,800	[1]22,000

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
EMP–Cartagena, Murcia	180,000	....	[1]25,000
Puertollano, Ciudad Real	135,000	[1]23,500	[2]18,000
Tarragona	225,000	[2]16,000	....
Petróleos del Mediterraneo– Castellón de la Plana	120,000	[1]14,000	[2]13,100
Petronor SA–Somorrostro, Vizcaya	240,000	....	[2]33,500
Unión Explosivos Rio Tinto SA– La Rábida, Huelva	80,000	....	[2]14,100
Total	**1,493,000**	**103,500**	**179,700**
SRI LANKA			
Ceylon Petroleum Corp.– Sapugaskanda	**50,000**	....	**[2]3,750**
SUDAN			
Port Sudan Refinery Ltd.–Port Sudan	**23,800**	....	**[1]1,700**
SWEDEN			
AB Nynas Petroleum–Gothenburg	12,000	....	....
Malmoe	3,000	....	....
Nynäshamn	28,000	....	....
BP Raffinaderi–Gothenburg	106,000	....	[2]20,500
Shell Raffinaderi AB–Gothenburg	80,000	....	17,000
Skandinaviska Raffinaderi AB– Brofjorden-Lysekil	210,000	[1]24,000	[2]36,000
Total	**439,000**	**24,000**	**73,500**
SWITZERLAND			
Raffinerie de Cressier SA–Cressier	55,000	....	15,000
Raffinerie du Sud-Ouest SA– Collombey	72,000	....	[2]10,000
Total	**127,000**	....	**25,000**
SYRIA			
Banias Refining Co.–Banias	126,350	....	[3]16,728
Homs Refinery Co.–Homs	102,440	....	[3]2,620
Total	**228,790**	....	**19,348**
TANZANIA			
Tanzanian & Italian Petroleum Refining CL–Kigamboni, Dar es Salaam	**13,500**	....	**[2]3,000**
THAILAND			
Esso Standard Thailand Ltd.–Cholburi	46,000	....	[1]6,000
Petroleum Authority of Thailand– Bangchak, Bangkok	65,000	....	[2]10,500
Thai Oil Refinery CL–Sriracha, Cholburi	60,600	[1]8,000	[1]2,800 [2]5,300
Total	**171,600**	**8,000**	**24,600**
TOGO			
Ste. Togolaise des Hydrocarbures– Lome	**20,000**	....	**[4]4,400**
TRINIDAD			
Texaco Trinidad Inc.–Pointe-a-Pierre	220,000	[1]25,000	[2]20,000
Trinidad and Tobago Oil CL–Point Fortin	100,000	....	[1]7,000
Total	**320,000**	**25,000**	**27,000**
TUNISIA			
Ste. Tunisienne Industries des Raffinage–Bizerte	**34,000**	....	**3,300**
TURKEY			
Anadolu Tasfiyehanesi AS–Mersin	90,000	....	[2]10,500
Turkish Petroleum Refineries Corp.:			
Aliaga-Izmir	102,020	[1]14,000	[2]9,827
Batman	20,000	[2]4,500	[1]1,300
Izmit	248,455	[1]20,100	[2]23,430
Total	**460,475**	**38,600**	**45,057**

WORLDWIDE REFINING	Crude	Catalytic cracking	Cat reforming
UNITED KINGDOM			
England			
Conoco Ltd.–South Killingholme	130,000	....	[2]64,000
Esso Petroleum CL–Fawley	300,200	120,840	[2]27,900 [4]22,500
Lindsey Oil Refinery Ltd.–Killingholm, South Humberside	190,000	[1]35,000	[2]33,600
Mobil Oil CL–Coryton, Essex	145,000	[1]43,000	[2]27,000
Phillips Imperial Petroleum Ltd.–Port Clarence	100,000	....	....
Philmac Oils Ltd.–Eastham, Cheshire	12,000	....	....
Shell U.K. Ltd.–Shell Haven	90,000	....	28,000
Stanlow	256,000	52,000	38,000
Teesport	104,000	....	15,000
Total	**1,327,200**	**206,500**	**256,000**
Scotland			
BP Refinery Grangemouth Ltd.–Grangemouth	178,500	[1]19,000	[2]23,000
Shell U.K. Ltd.–Ardrossan	5,000	....	....
Total	**183,500**	**19,000**	**23,000**
Wales			
Amoco UK Ltd.–Milford Haven	102,000	[1]31,500	[2]17,500
BP Refinery Llandarcy Ltd.–Llandarcy, Neath	112,000	[1]18,000	[1]12,000
Refining Ltd.–Milford Haven	103,000	....	[2]22,000
Pembroke Cracking Co. (65% Texaco, 35% Gulf)		[1]81,500	
Texaco Ltd.–Pembroke, Dyfed	180,000	....	[2]19,000
Total	**497,000**	**131,000**	**70,500**
Total United Kingdom	**2,007,700**	**356,500**	**349,500**
URUGUAY			
Administración Nacional de Combustibles, Alcohol y Portland–La Teja, Montevideo	**45,000**	**[1]5,000**	**[1]3,000**
U.S.S.R.			
Government-owned refineries at Achinsk, Angarsk, Baku, Batumi, Drogobych, Fergana, Gorki, Grozny, Guryev, Ishimbai, Khabarovsk, Kherson, Kirishi, Komsomolsk, Krasnovodsk, Kremenchug, Kuibyshev, Lisichansk, Mazheikiai, Moscow, Mozyr, Nadvornaya, Nizhnekamsk, Odessa, Omsk, Orsk, Pavlodar, Perm, Polotsk, Ryazan, Saratov, Syzran, Tuapse, Ufa, Ukhta, Vannovskiy, Volgograd, and Yaroslavl			
Total		**12,000,000**	
VENEZUELA			
Corpoven–Bajo Grande	57,000	....	....
El Palito	100,000	[1]39,100	[1]6,000
El Toreno	4,500	....	....
Lagoven–Amuay Bay	600,000	[1]71,300	....
Maraven–Punta Cardon	265,000	[1]57,600	....
Meneven–Puerto La Cruz	192,500	[1]11,400	....
San Roque	5,200	....	....
Total	**1,224,200**	**179,400**	**6,000**
VIRGIN ISLANDS			
Hess Oil Virgin Islands Corp.–St. Croix	**545,000**	....	**[2]125,000**
YEMEN, S.			
Aden Refinery Co.–Little Aden	**178,000**	....	**[1]12,000**
YUGOSLAVIA			
Bosanski Brod	43,129	....	[2]6,360
Lendava	13,180	....	....
Novi Sad	11,100	....	....
Pancevo	29,878	....	3,996
Rijeka	160,000	....	18,500
Sisak	38,800	[1]1,960	16,300
Zagreb	600	....	....
Total	**296,687**	**1,960**	**45,156**
ZAIRE			
Soc. Zairo-Italienne de Raffinage–Muanda	**17,000**	....	**[1]3,000**
ZAMBIA			
Indeni Petroleum Refinery CL–Bwana Nkubwa Area, Ndola	**24,500**	....	**[2]5,600**

UNITED STATES

Survey of operating refineries in the U.S. (state capacities as of January 1, 1985)

State	No. plants	Crude capacity b/cd	Cat cracking Fresh feed	Cat reforming
Alabama	1	80,000	......	21,000
Alaska	4	138,930	......	12,000
Arizona	1	5,000	......	......
Arkansas	4	69,170	18,500	9,000
California	30	2,265,098	571,500	512,350
Colorado	3	94,700	23,000	20,400
Delaware	1	140,000	60,000	56,000
Georgia	2	28,800	......	......
Hawaii	2	109,500	22,000	13,000
Illinois	8	946,000	374,000	298,400
Indiana	5	431,300	166,000	84,500
Kansas	7	338,000	124,500	88,600
Kentucky	2	218,900	100,000	46,000
Louisiana	16	2,188,793	765,400	462,000
Maryland	1	14,200	......	......
Michigan	4	119,400	45,000	33,000
Minnesota	2	204,143	78,000	39,000
Mississippi	5	362,400	74,000	95,800
Montana	6	147,500	50,600	41,000
Nevada	1	4,500	......	......
New Jersey	5	503,000	229,000	125,500
New Mexico	3	63,050	27,100	17,300
North Dakota	2	62,800	26,000	12,000
Ohio	5	515,700	185,700	159,700
Oklahoma	5	374,000	133,500	97,000
Oregon	1	15,000	......	......
Pennsylvania	8	658,700	242,300	189,200
Tennessee	1	57,000	30,000	8,000
Texas	33	4,145,900	1,572,500	1,046,300
Utah	6	154,950	54,800	25,500
Virginia	1	51,000	27,500	8,750
Washington	7	410,550	91,500	103,800
West Virginia	2	16,500	......	4,400
Wisconsin	1	39,000	9,700	9,800
Wyoming	6	162,778	63,833	32,027
Total	**191**	**15,136,262**	**5,165,933**	**3,671,327**

U.S. refineries

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
ALABAMA			
Louisiana Land & Exploration Co.—Saraland	80,000	......	[2]21,000
Total	**80,000**	......	**21,000**
ALASKA			
Atlantic Richfield Co.—Prudhoe Bay	22,000	......	......
Chevron U.S.A. Inc.—Kenai	22,000	......	......
Mapco Petroleum Inc.—North Pole	46,430	......	......
Tesoro Petroleum Corp.—Kenai	48,500	......	[2]12,000
Total	**138,930**	......	**12,000**
ARIZONA			
Intermountain Refining Cl—Fredonia	5,000	......	......
Total	**5,000**	......	......
ARKANSAS			
Berry Petroleum, subsidiary of Crystal Oil Co.—Stevens	3,500	......	......
Cross Oil & Refining Co. of Arkansas—Smackover	9,800	......	......
Macmillan Ring-Free Oil Cl—Norphlet	5,870	......	......
Tosco Corp.—El Dorado	50,000	[1]18,500	[2]9,000
Total	**69,170**	**18,500**	**9,000**
CALIFORNIA			
Anchor Refining Cl—McKittrick	10,000	......	......
Atlantic Richfield Co.—Carson	215,000	[1]62,000	[2]44,000
Beacon Oil Co.—Hanford	17,880	......	[2]3,650
Champlin Petroleum Co.—Wilmington	60,000	[1]32,000	[5]13,000
Chevron U.S.A. Inc.—Bakersfield	26,000	......	[2]6,000
El Segundo	405,000	[1]60,000	[2]60,000
Richmond	365,000	[1]63,000	[2]84,000
Conoco Inc.—Santa Maria	9,500	......	......
Edgington Oil Cl—Long Beach	35,000	......	......
Exxon Co.—Benicia	109,000	[1]57,000	[4]28,000
Fletcher Oil & Refining Co.—Carson	29,500	[1]10,000	[2]4,200
Golden Bear Division, Witco Chemical Corp.—Oildale	10,818	......	......
Golden West Refining Co.—Santa Fe Springs	40,600	[1]13,500	[2]19,000
Huntway Refining Co.—Benicia	8,400	......	......
Wilmington	5,500	......	......
Kern County Refinery Inc.—Bakersfield	21,400	......	[2]3,000
Macmillan Ring-Free Oil Cl—Signal Hill	13,000	......	......
Mobil Oil Corp.—Torrance	123,500	[1]61,000	[2]36,000
Newhall Refining Cl—Newhall	21,400	......	[1]2,300
Oxnard Refinery—Oxnard	4,700	......	......
Pacific Refining Co.—Hercules	55,000	......	[2]15,000
Sabre Refining Inc.—Bakersfield	9,500	......	......
San Joaquin Refining Cl—Bakersfield	12,000	......	......
Shell Oil Co.—Martinez	91,400	[1]60,000	[3]23,000
Wilmington	108,000	[1]35,000	[2]24,000
Texaco Refining & Marketing Inc.—Bakersfield	38,000	......	[2]6,500
Wilmington	75,000	[1]28,000	[2]35,000
Tosco Corp.—Martinez	126,000	[1]45,000	[2]8,700 [6]20,000
Union Oil Co. of California—Los Angeles	108,000	[1]45,000	[2]49,000
Rodeo	111,000	......	[2]28,000
Total	**2,265,098**	**571,500**	**512,350**
COLORADO			
Asamera Oil U.S. Inc.—Commerce City	NR	[1]8,000	[2]10,000
Conoco Inc.—Commerce City	41,500	[1]15,000	[2]7,000
Gary Refining Co.—Fruita	15,200	......	[2]3,400
Total	**94,700**	**23,000**	**20,400**
DELAWARE			
Texaco Refining and Marketing Inc.—Delaware City	140,000	[1]60,000	[2]21,000 [6]35,000
Total	**140,000**	**60,000**	**56,000**
GEORGIA			
Amoco Oil Co.—Savannah	24,000	......	......
Young Refining Corp.—Douglasville	4,800	......	......
Total	**28,800**	......	......
HAWAII			
Chevron U.S.A. Inc.—Barber's Point	48,000	[1]22,000	......
Hawaiian Independent Refinery Inc.—Ewa Beach	61,500	......	[2]13,000
Total	**109,500**	**22,000**	**13,000**
ILLINOIS			
Calumet Industries Inc.—Burnham	500	......	......
Clark Oil & Refining Corp.—Blue Island	57,000	[1]25,000	[2]30,500
Hartford	47,500	[1]27,000	[2]12,000
Marathon Oil Co.—Robinson	195,000	[1]38,000	[1]12,400
Mobil Oil Corp.—Joliet	180,000	[1]98,000	[2]46,000
Shell Oil Co.—Wood River	250,000	[1]94,000	[2]22,000 [3]68,000
Texaco Refining & Marketing Inc.—Lawrenceville	65,000	[1]34,000	[2]12,000
Union Oil Co. of California—Lemont	151,000	[1]58,000	[2]30,500
Total	**946,000**	**374,000**	**298,400**
INDIANA			
Amoco Oil Co.—Whiting	350,000	[1]140,000	[3]73,000
Gladieux Refinery Inc.—Ft. Wayne	18,600	......	......
Indiana Farm Bureau Cooperative Association Inc.—Mt. Vernon	20,600	[1]7,000	[2]3,500
Laketon Refining Corp.—Laketon	10,000	......	......
Rock Island Refining Corp.—Indianapolis	32,100	[1]19,000	[2]8,000
Total	**431,300**	**166,000**	**84,500**
KANSAS			
Derby Refining Co.—Wichita	28,800	[1]17,000	[2]7,000
Farmland Industries Inc.—Coffeyville	56,500	[1]23,000	[2]16,000
Phillipsburg	26,400	......	[1]5,300
National Cooperative Refinery Association—McPherson	70,000	[1]20,000	[2]14,000
Pester Refining Co.—El Dorado	31,000	[1]14,500	[2]5,000
Texaco Refining & Marketing Inc.—El Dorado	80,000	[1]32,000	[2]25,000
Total Petroleum Inc.—Arkansas City	45,300	[1]18,000	[2]16,300
Total	**338,000**	**124,500**	**88,600**
KENTUCKY			
Ashland Petroleum Co.—Catlettsburg	213,400	[1]60,000 §40,000	[2]18,000

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Somerset Refinery Inc.—Somerset	5,500	......	^{2}1,000
Total	**218,900**	**100,000**	**46,000**

§Reduced crude converter

LOUISIANA

Atlas Processing Co., Division of Pennzoil—Shreveport	46,200	......	^{2}10,000
Calcasieu Refining Co.—Lake Charles	12,500	......	......
Calumet Refining Co.—Princeton	4,200	......	......
Canal Refining Co.—Church Point	7,858	......	^{1}1,600
Citgo Petroleum Corp.—Lake Charles	320,000	^{1}150,000	^{2}46,000 ^{5}45,000
Claiborne Gasoline Co.—Lisbon	NR	......	^{2}2,000
Conoco Inc.—Lake Charles	156,500	^{1}30,600	^{2}15,000 ^{5}12,400
Cotton Valley Refinery (Kerr-McGee Refining Corp.)—Cotton Valley	NR	......	......
Exxon Co.—Baton Rouge	455,000	^{1}155,000	^{4}95,000
Gulf Products Co.—Belle Chasse	198,500	^{1}89,000	^{2}40,000
Marathon Oil Co.—Garyville	255,000	^{1}75,000	^{6}50,000
Murphy Oil USA Inc.—Meraux	92,500	^{1}35,300	^{6}23,000
Placid Refining Co.—Port Allen	46,000	^{1}18,500	^{2}7,000
Shell Oil Co.—Norco	218,000	^{1}100,000	^{3}28,000
Tenneco Oil Co.—Chalmette	137,000	^{1}42,000	^{2}28,000 ^{5}19,000
Texaco Refining & Marketing Inc.—Convent	225,000	^{1}70,000	^{2}40,000
Total	**2,188,793**	**765,400**	**462,000**

MARYLAND

Chevron U.S.A. Inc.—Baltimore	**14,200**	......	......

MICHIGAN

Crystal Refining Co.—Carson City	4,000	......	......
Lakeside Refining Co.—Kalamazoo	5,600	......	^{1}2,000
Marathon Oil Co.—Detroit	68,500	^{1}27,000	^{2}17,000
Total Petroleum Inc.—Alma	41,300	^{1}18,000	^{2}14,000
Total	**119,400**	**45,000**	**33,000**

MINNESOTA

Ashland Petroleum Co.—St. Paul Park	67,143	^{1}23,000	^{2}13,000
Koch Refining Co.—Rosemount	137,000	^{1}55,000	^{5}26,000
Total	**204,143**	**78,000**	**39,000**

MISSISSIPPI

Amerada-Hess Corp.—Purvis	30,000	^{1}18,000	^{2}5,800
Chevron U.S.A. Inc.—Pascagoula	295,000	^{1}56,000	^{2}90,000
Ergon Refining Inc.—Vicksburg	20,600	......	......
Southland Oil Co.—Lumberton	5,800	......	......

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Sandersville	11,000	......	......
Total	**362,400**	**74,000**	**95,800**

MONTANA

Cenex—Laurel	40,400	^{1}12,000	^{2}12,000
Conoco Inc.—Billings	48,500	^{1}15,500	^{2}15,800
Exxon Co.—Billings	42,000	^{1}21,000	^{1}10,000
Flying J Inc.—Cut Bank	5,600	......	^{2}2,200
Kenco Refining Inc.—Wolf Point	4,700	......	......
Montana Refining Co.—Great Falls	6,300	^{1}2,100	^{2}1,000
Total	**147,500**	**50,600**	**41,000**

NEVADA

Nevada Refining Co.—Tonopah	**4,500**	......	......

NEW JERSEY

Chevron U.S.A. Inc.—Perth Amboy	168,000	^{2}33,000	^{2}39,000
Exxon Co.—Linden	100,000	^{1}120,000	^{4}25,000
Mobil Oil Corp.—Paulsboro	100,000	^{1}36,000	^{2}23,500
Seaview Petroleum Inc.—Thorofare	45,000	......	......
Texaco Refining & Marketing Inc.—Westville	90,000	^{1}40,000	^{2}38,000
Total	**503,000**	**229,000**	**125,500**

NEW MEXICO

Bloomfield Refining Co.—Bloomfield	13,700	^{1}5,400	^{2}2,800
Giant Industries Inc.—Gallup	18,000	^{1}7,200	^{2}6,800
Navajo Refining Co.—Artesia	NR	^{1}14,500	^{1}1,700 ^{2}6,000
Total	**63,050**	**27,100**	**17,300**

NORTH DAKOTA

Amoco Oil Co.—Mandan	58,000	^{1}26,000	^{4}10,000
Flying J Inc.—Williston	4,800	......	^{2}2,000
Total	**62,800**	**26,000**	**12,000**

OHIO

Ashland Petroleum Co.—Canton	66,000	^{1}25,000	^{6}20,000
Gulf Oil Products Co.—Cincinnati	43,700	^{1}18,000	^{2}11,000
Standard Oil Co. of Ohio—Lima	168,000	^{1}37,700	^{3}47,000
Toledo	120,000	^{1}55,000	^{3}40,700
Sun CI-Toledo	118,000	^{1}50,000	^{2}41.000
Total	**515,700**	**185,700**	**159,700**

OKLAHOMA

Conoco Inc.—Ponca City	134,000	^{1}45,000	^{2}33,500
Kerr-McGee Refining Corp.—Wynnewood	43,000	^{1}20,000	^{2}8,500
Sinclair Oil Corp.—Tulsa	50,000	^{1}18,000	^{2}20,000
Sun CI—Tulsa	85,000	^{1}28,000	^{2}23,000
Total Petroleum Inc.—Ardmore	62,000	^{1}22,500	^{6}12,000
Total	**374,000**	**133,500**	**97,000**

RECENT additions enhance Texaco's Port Arthur, Tex., refinery.

OREGON

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Chevron U.S.A. Inc.—Portland	**15,000**	......	......

PENNSYLVANIA

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Atlantic Richfield Co.—Philadelphia	125,000	[1]29,000	[2]60,000
BP Oil Corp.—Marcus Hook	168,000	[1]48,000	[6]50,000
Gulf Oil Products Co.—Philadelphia	174,100	[1]85,300	[2]34,000
Kendall-Amalie Division, Witco Chemical Co.—Bradford	7,600	......	......
Pennzoil Products Co.—Rouseville	15,700	......	[2]3,600
Quaker State Oil Refining Corp— Farmers Valley	6,500	......	[2]2,000
Sun CI—Marcus Hook	155,000	[1]80,000	[1]10,800 [2]28,800
Valvoline Oil Co., Division of Ashland Oil Co.—Freedom	6,800	......	......
Total	**658,700**	**242,300**	**189,200**

TENNESSEE

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Mapco Petroleum Inc.—Memphis	NR	[1]30,000	[2]8,000
Total	**57,000**	**30,000**	**8,000**

TEXAS

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Amber Refining Co.—Fort Worth	14,500	[1]5,000	[1]1,700 [2]3,800
American Petrofina Inc.—Port Arthur	90,000	[1]34,000	[2]20,000
Amoco Oil Co.—Texas City	415,000	[1]194,000	[4]152,000
Atlantic Richfield Co.—Houston	260,000	[1]78,000	[2]68,000
Champlin Petroleum Co.—Corpus Christi	170,000	[1]69,000	[5]50,000
Charter International Oil Co.—Houston	NR	[1]50,000	[2]13,500
Chevron U.S.A. Inc.—El Paso	76,000	[1]22,000	[2]25,000
Coastal States Petroleum Co.— Corpus Christi	95,000	[1]19,500	[5]20,000
Cosden Oil & Chemical (subsidiary of American Petrofina)—Big Spring	NR	[1]23,500	[2]20,000
Crown Central Petroleum Corp.—Houston	100,000	[1]56,000	[2]14,000 [5]22,000
Diamond Shamrock Corp.—Sunray	75,000	[1]45,000	[2]16,000
Three Rivers	47,000	[1]17,000	[2]8,000
Exxon Co. U.S.A.—Baytown	494,000	[1]155,000	[4]123,000
Gulf Oil Products—Port Arthur	406,900	[1]110,000	[2]23,000 [4]44,100
Howell Hydrocarbons Inc.—San Antonio	9,600	......	[6]1,200
Koch Refining Co.—Corpus Christi	125,000	[1]29,500	[1]13,000 [3]15,000
LaGloria Oil & Gas Co.—Tyler	65,000	[1]17,000	[2]7,000 [6]11,700
Liquid Energy Corp.—Bridgeport	10,000	......	......
Marathon Petroleum Co.—Texas City	69,500	[1]38,000	[1]8,000
Mobil Oil Corp.—Beaumont	270,000	[1]102,000	[2]103,000
Phillips Petroleum Co.—Borger	100,000	[1]60,000	[1]7,000 [2]19,000
Sweeny	175,000	[1]87,000	[2]36,000
Pride Refining Inc.—Abilene	42,750	......	......
Saber Energy Inc.—Corpus Christi	NR	[4]41,500	......
Shell Oil Co.—Deer Park	250,000	[1]60,000	[2]15,000 [3]40,000
Odessa	30,600	[1]10,500	[1]11,000
Southwestern Refining CI—Corpus Christi	104,000	[1]50,000	[2]30,000
Texaco Refining & Marketing Inc.—			
Amarillo	20,000	[1]8,000	[2]5,000
El Paso	17,000	[1]7,000	[2]4,800
Port Arthur	200,000	[1]105,000	[6]40,000
Port Neches	31,000	......	......
Texas City Refining Inc.—Texas City	119,600	[1]40,000	[1]11,000 [5]12,000
Union Oil Co. of California— (Beaumont), Nederland	120,000	[1]39,000	[3]12,500 [4]20,000
Total	**4,145,900**	**1,572,500**	**1,046,300**

UTAH

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Amoco Oil Co.—Salt Lake City	40,000	[1]18,000	[4]6,000
Chevron U.S.A.—Salt Lake City	45,000	[1]11,000 [2]7,000	[2]5,500
Crysen Refining Inc.—Woods Cross	NR	......	[1]3,000
RMT Properties Inc.—Salt Lake City	25,000	[1]4,400	[2]5,000
Phillips Petroleum Co.—Woods Cross	25,000	[2]8,400	[2]6,000
Seagull Refining Co.—Roosevelt	NR	[1]6,000	......
Total	**154,950**	**54,800**	**25,500**

VIRGINIA

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Amoco Oil Co.—Yorktown	51,000	[1]27,500	[2]8,750
Total	**51,000**	**27,500**	**8,750**

WASHINGTON

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Atlantic Richfield Co.—Ferndale	146,000	......	[2]46,000
Chevron U.S.A. Inc.—Seattle	5,500	......	......
Mobil Oil Corp.—Ferndale	71,500	[2]25,500	[2]11,800
Shell Oil Co.—Anacortes	72,000	[1]36,000	[3]20,000
Sound Refining Inc.—Tacoma	11,900	......	......
Texaco Refining & Marketing Inc.— Anacortes	78,000	[1]30,000	[2]20,000
U.S. Oil & Refining Co.—Tacoma	NR	......	[2]6,000
Total	**410,550**	**91,500**	**103,800**

WEST VIRGINIA

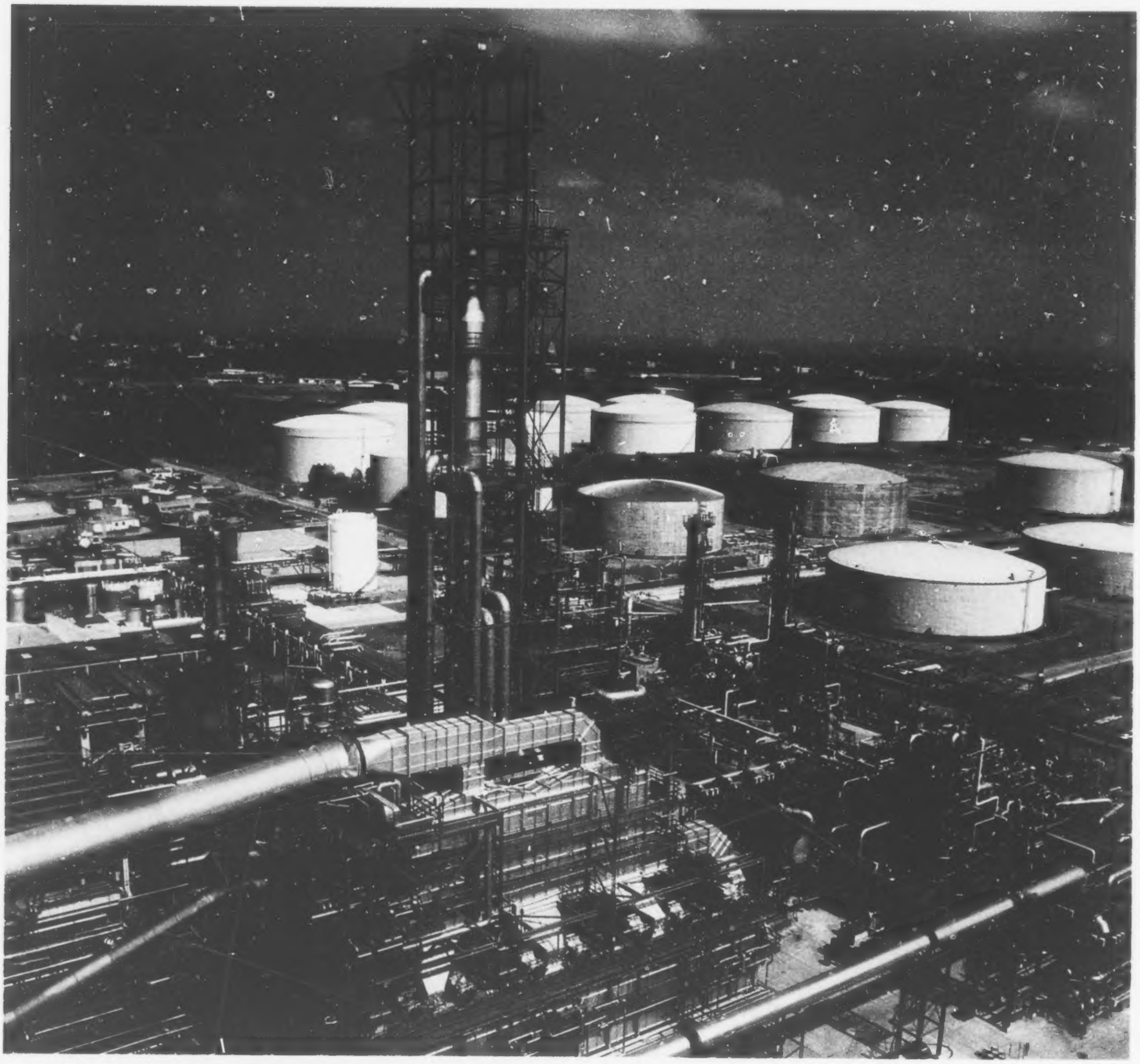
Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Quaker State Oil Refining Corp.—			
Newell	11,700	......	[2]3,200
St. Mary's	4,800	......	[2]1,200
Total	**16,500**	......	**4,400**

WISCONSIN

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Murphy Oil USA Inc.—Superior	**39,000**	**[1]9,700**	**[2]9,800**

WYOMING

Company and refinery location	Crude	Catalytic cracking	Catalytic reforming
Amoco Oil Co.—Casper	48,000	[1]13,500	[4]6,000
RMT Properties Inc.—Cheyenne	28,800	[1]12,000	[1]1,000 [2]5,500
Little America Refining Co.—Casper	20,000	[1]13,333	[4]6,777
Mountaineer Refining CI—LaBarge	NR	......	......
Sinclair Oil Corp.—Sinclair	53,000	[1]21,000	[1]10,000
Wyoming Refining Co.—Newcastle	12,500	[2]4,000	[1]2,750
Total	**162,778**	**63,833**	**32,027**



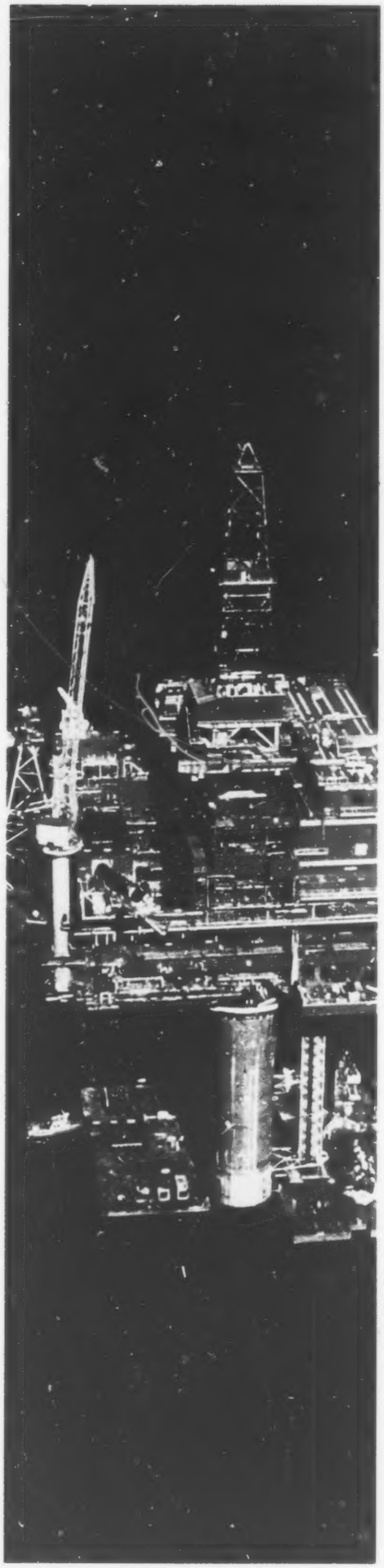
CONTINUOUS cat reformer goes on stream at West Germany's Deutsche Shell AG Godorf refinery.

Refinery throughputs

(Thousand barrels daily)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
U.S.	12,555	12,280	12,475	13,435	14,625	14,780	14,465	13,520	12,470	11,775	11,215
Canada	1,675	1,765	1,700	1,710	1,805	1,820	1,960	2,085	1,945	1,650	1,670
Latin America	5,970	5,890	5,515	5,670	5,715	5,975	6,220	6,460	6,575	6,080	5,825
Western Europe	15,065	14,175	12,415	13,625	13,550	13,505	14,160	12,925	11,890	11,480	11,075
Middle East	2,170	2,330	2,075	2,300	2,240	2,535	2,365	2,445	2,205	2,245	2,515
Africa	930	930	1,005	1,055	1,165	1,280	1,355	1,460	1,525	1,735	1,920
Japan	4,430	4,300	4,055	4,230	4,285	4,240	4,340	4,015	3,630	3,360	3,240
Southeast Asia	1,705	1,560	1,545	1,865	2,030	2,330	2,450	2,370	2,480	2,335	2,335
South Asia	590	550	485	550	605	645	675	705	795	840	880
Australasia	620	625	635	655	680	690	700	640	655	625	600
Total Non-Communist	45,710	44,405	41,905	45,095	46,700	47,800	48,690	46,625	44,170	42,125	41,175
Communist	9,365	10,185	11,025	11,575	11,930	12,875	13,230	13,320	13,420	13,575	13,675
Total World	55,075	54,590	52,930	56,670	58,630	60,675	61,920	59,945	57,590	55,700	54,850

Source: British Petroleum



Comparison of worldwide energy prices

	1978	1979	1980	1981	1982	1983
Motor gasoline* (U.S. cents per gallon including taxes)						
Australia	79.5	106.0	131.5	154.8	148.8	146.0
Canada	69.0	73.5	84.5	113.8	136.5	147.3
France	214.5	256.3	302.8	269.8	255.5	237.5
Italy	227.0	246.0	311.3	293.3	291.3	288.5
Japan	199.0	210.5	257.0	264.5	261.5	252.3
Netherlands	188.8	224.5	273.5	256.8	246.8	230.3
Sweden	156.2	194.0	264.0	264.3	239.5	206.8
United Kingdom	121.8	179.3	250.0	257.0	241.5	225.3
United States	67.8	87.5	122.8	136.5	130.5	125.0
West Germany	175.3	206.0	242.8	238.0	217.0	203.8
Diesel fuel† (U.S. cents per gallon including taxes)						
Australia	74.5	90.8	126.5	146.3	144.0	150.3
France	109.5	140.3	179.3	168.3	162.0	153.8
Italy	65.8	79.5	122.3	108.3	116.3	134.0
Netherlands	92.0	119.8	156.0	144.8	143.5	127.0
Sweden	62.3	82.8	131.0	135.3	141.5	126.5
United Kingdom	124.3	170.5	219.3	222.5	205.5	186.8
United States	52.8	72.5	99.0	117.8	116.5	114.5
West Germany	148.0	177.5	210.0	190.0	180.8	166.0
Light fuel oil for household use (U.S. cents per gallon including taxes)						
Australia	57.8	76.0	113.5	134.0	141.0	143.3
Canada	41.0	44.5	53.8	74.3	89.5	99.0
France	71.5	93.3	138.8	140.0	137.3	130.3
Italy	66.5	84.8	137.3	122.3	134.5	136.0
Japan	77.0	90.0	148.5	162.0	159.5	159.3
Netherlands	66.0	92.8	135.3	140.3	134.0	115.3
Sweden	52.8	76.0	122.3	125.5	129.8	114.0
United Kingdom	61.5	85.5	128.5	131.3	133.0	120.0
United States	49.0	67.8	96.3	119.5	117.8	107.5
West Germany	58.3	104.3	129.8	119.8	123.0	107.0
Light fuel oil for industrial use (U.S. cents per gallon including taxes)						
Australia	50.0	65.3	100.0	117.8	120.3	136.0
Canada	46.0	45.5	54.8	74.8	89.8	100.0
France	60.8	79.3	118.3	119.0	116.0	110.0
Italy	58.8	74.3	120.5	106.3	117.3	118.3
Japan	NA	NA	123.3	140.3	160.5	170.0
Netherlands	56.3	75.0	112.8	106.5	NA	NA
Sweden	52.8	79.0	120.3	126.8	132.5	114.0
United Kingdom	48.3	72.5	113.3	112.3	106.3	95.0
United States	39.3	57.5	83.5	108.0	105.5	89.0
West Germany	52.0	92.0	114.5	106.0	109.0	94.0
Heavy fuel oil for industrial use (U.S. dollars per barrel including taxes)						
Australia	13.79	17.09	29.89	36.62	36.19	35.04
Canada	13.80	15.39	18.69	26.95	32.85	36.87
France	13.99	18.33	27.39	30.07	28.59	27.49
Italy	13.30	17.85	27.41	29.76	26.55	25.65
Japan	NA	NA	43.37	39.99	38.31	11.40
Netherlands	14.89	17.84	28.04	33.05	29.77	28.11
Sweden	16.63	25.02	35.28	43.46	40.27	36.61
United Kingdom	15.36	21.29	32.20	33.89	31.28	29.53
United States	11.78	15.98	21.05	28.51	25.86	25.74
West Germany	15.59	20.62	28.01	32.19	28.48	26.89
Natural gas for industrial use§ (U.S. dollars per Mcf including taxes)						
Australia	3.26	3.18	3.63	4.15	3.95	3.80
Canada	1.42	1.52	1.69	2.30	2.68	2.96
France	2.35	2.73	4.19	4.46	4.53	4.34
Italy	2.14	3.00	4.48	4.71	5.08	4.38
Japan	9.29	8.97	10.17	11.65	10.60	10.82
Netherlands	2.40	2.89	3.88	4.39	NA	NA
United Kingdom	2.13	2.60	3.88	4.12	3.83	3.44
United States	1.41	2.31	2.52	3.08	3.71	4.29
West Germany	2.55	2.88	3.74	3.90	4.82	4.98
Natural gas for household use§ (U.S. dollars per mcf including taxes)						
Australia	3.37	4.37	4.82	5.56	5.46	5.11
Canada	2.47	2.39	2.68	3.34	3.81	4.46
France	6.56	7.62	9.85	9.67	9.36	9.29
Italy	4.43	5.44	6.64	6.70	7.12	7.07
Japan	11.68	11.40	13.79	16.12	14.70	15.25
Netherlands	4.21	4.88	5.98	5.94	6.74	6.70
United Kingdom	3.43	3.95	5.25	5.54	5.89	5.69
United States	2.57	3.19	3.91	4.22	5.10	6.04
West Germany	6.09	6.71	7.93	7.67	8.66	8.26

NA = Not available. * For U.S., Canada and Japan, price is for unleaded regular. All other countries are premium gasoline. † Diesel fuel prices not available for Canada and Japan. § Natural gas prices not available for Sweden.

Source: Energy Information Administration

1983 was stabilizing year for the oil industry

1983 performance of 26 large U.S. oil companies

Total assets	$386.1 billion	Up 2.3%
Net profits	$22.3 billion	Down 0.1%
Return on stockholder's equity	12.3%	Down 0.6 percentage points
Return on total assets	5.8%	Down 0.1 percentage points
Capital and exploration expenditures	$48.6 billion	Down 25.8%
Net liquids production	14.3 million b/d	Down 9.6%
Net gas production	28.1 billion cfd	Down 4.6%
Crude runs to stills	15.4 million b/d	Down 1.4%
Oil reserves	34.7 billion bbl	Up 0.3%
Gas reserves	154.4 trillion cu ft	Down 0.6%

Source: Oil & Gas Journal

PROFITS FOR A GROUP OF 26 of the largest U.S. oil companies stabilized in 1983, after falling the previous 2 years.

And the group's profit picture started last year on the right track. First quarter profits jumped 31.8% from the same quarter of 1983.

Figures for the group were compiled in a survey conducted by Oil & Gas Journal.

The 26 oil companies reported net income of $22.3 billion for 1983, down only 0.1% from 1982. Group earnings peaked in 1980 at $29.3 billion, then fell slightly—0.5%—in 1981 and sharply—20.9%—in 1982.

As profits dropped in 1982, most firms rapidly adjusted by cutting costs and/or selling or shutting down unprofitable segments of their business.

Return on investment was down again in 1983, but the decline was very slight.

Return on stockholders equity fell 0.6 percentage point to 12.3%. Return on total assets fell only 0.1 percentage point to 5.8%. Return on assets peaked in 1980 at 9.3%, and return on stockholders equity was at a high in the same year at 21.0%.

The OGJ group did slightly better in 1983 than a group of 400 industrial companies as reported by Standard & Poor's Compustat Services. For that group, return on stockholders equity was 11.3% and return on total assets 5.2%.

However, for the Standard & Poor's 400, this was an improvement over 1982 when return on stockholders equity was 10.3% and return on total assets 4.7%. As the economy moved out of the recession, many industrial companies experienced an increase in sales.

But the oil industry still faced declining demand.

The OGJ group's total revenues fell again in 1983, reflecting lower crude oil prices, stable natural gas prices, and reduced production of oil and gas.

Revenues were down 3.8% at $500 billion. Revenues hit a peak in 1981 of $567 billion. That was the year of top prices for crude oil and petroleum products.

The stabilizing of profits stemmed mainly from companies' cost cutting and streamlining efforts. The rate of fall in demand and prices slowed somewhat in 1983 but continued the downward trend.

Demand for petroleum products in the 21 member International Energy Agency (IEA) fell 0.7% to 29.7 million b/d in 1983. Demand among IEA members had fallen 6 million b/d or 16.7% from the peak in 1979 through 1982.

The average U.S. refiner acquisition cost of imported crude oil, a good indication of the average price of world exported crude oil, fell 12.7% to $29.30/bbl.

This followed a 9.4% drop in 1982 from the 1981 peak price of $37.05/bbl.

Compounding the profit problem in 1983 was a sharp drop in U.S. demand for natural gas. Marketed production plummeted 10.4% to 16.6 trillion cu ft—the lowest level since 1965.

And the rise in natural gas prices slowed markedly.

Petroleum products prices didn't fall as sharply as crude prices in 1983, and this led to improved refiner margins.

In addition, refiners continued to trim capacity and thus improve utilization rate. The average rate moved up to 71.6% from 69.8% in 1982.

The OGJ group cut capital and exploration outlays 25.8% in 1983 to $48.6 billion.

However, 1983 outlays were a relatively high 217% of profits. Expenditures in 1982 were the highest relative level in at least the last 10 years at 287.5% of net income.

Since 1973, the group's capital expenditures have averaged 209.4% of profits.

Another favorable development for the group was the stabilization of reserves.

Total liquid reserves moved up 0.3% to 34.7 billion bbl. This followed declines of 3.1% in 1982 and 2.8% in 1981.

Natural gas reserves fell in 1983, but only 0.6% to 154.4 trillion cu ft.

The leveling of reserves was partly due to a drop in production. Liquids production for the group dropped 9.6% to 14.3 million b/d, and gas production fell 4.6% to 28.1 billion cfd.

Net wells drilled by the group didn't fall as sharply as expenditures, dropping only 3.1% to 10,879.5 wells.

The group's refined product sales were up only 0.1% at 18.7 million b/d, but this was a relatively strong performance with declining demand in the U.S. and IEA countries. Crude runs to stills were down 1.4%, reflecting the drop in demand.

Revenues, profits. The OGJ group was almost evenly split in profit performance, with 12 companies posting increases, 13 showing declines, and 1 company recording a loss for 1983.

Occidental Petroleum Corp. had the largest relative increase in profits, up 264.2% at $566.7 million. This was a reversal of its performance the previous year when the firm posted the sharpest drop—78.5% to $155.6 million. The 1983 earnings reflected the first full year's contribution from Cities Service Co., which Oxy acquired in December 1982.

Two firms in the top 10 of the OGJ group, Standard Oil Co. of California and Gulf Corp., have merged. Both posted increased profits for 1983 even though revenues were down.

Gulf attributed a good portion of the improvement in earnings to its restructuring to accommodate lower demand for petroleum products. Gulf got rid of marginal refining, marketing, and chemical operations with the sale of European assets, adding nearly $150 million to net income.

Socal attributed part of its earnings improvement to decreased reliance on Saudi Arabian crude oil, which was priced higher than the world market in 1982.

Texaco Inc. and Getty Oil Co., also merged, posted a drop in profits and revenues.

Texaco blamed its lower earnings on relatively weak petroleum demand in the U.S. and other industrialized countries. Texaco also had an $87 million aftertax charge related to its interest in the Mukluk wildcat dry hole off Alaska's North Slope.

The drop in Getty's earnings was due to a $250 million aftertax charge related to potential liabilities from a 1977 Department of Energy charge that the company had violated crude oil price regulations.

The remaining two megamerger firms, Mobil Corp. and Superior Oil Co., recorded improved earnings and lower revenues.

Mobil estimated it reduced costs by more than $1 billion during the past 3 years by eliminating marginal operations and streamlining profitable ones. That made a big contribution to improved earnings.

The wave of mergers will greatly alter OGJ's group of oil companies. Three giant firms with assets of $35-45 billion will appear in future reports on the group.

Combined 1983 assets of Socal and Gulf total $46.8 billion, Mobil and Superior $40.3 billion, and Texaco and Getty $37.6 billion. It will be some time before the final shape and size of these companies are determined.

Diamond Shamrock posted a loss of $56.2 million in 1983, following a profit of $185.1 million the previous year. The loss was due to the writeoff of $194.3 million invested in the Mukluk failure.

Operations picture. The slight rise in liquids reserves broke a string of declines registered by the group since reserves figures were first published in 1976.

Among firms with reserves of more than 1 billion bbl, Phillips Petroleum Co. posted the largest relative increase with reserves up 14.5% to 1.048 billion bbl.

Of the 133 million bbl increase, 92 million bbl was due to Phillips's purchase of General American Oil Co. in 1983.

Gulf's reserves increased 4.0% to 2.046 billion bbl due to drilling, improved recovery methods, and revisions of past estimates.

Mobil boosted its worldwide natural gas reserves 6.2% to 18.3 trillion cu ft, mainly on the strength of a revision of an estimate for Arun field in Indonesia.

Detracting from the improvement in reserves for the group was the drop in liquids and natural gas production.

Socal's worldwide production fell 26% to 1.371 million b/d. Because of the generally high price of Arabian crude, the firm cut foreign production by 31.9% to 1.018 million b/d. U.S. production fell 4.3% to 353,000 b/d.

All the remaining partners in Arabian American Oil Co. posted declines in worldwide liquids production. Exxon Corp. recorded production of 2.582 million b/d, down 16.7%, Mobil 1.223 million b/d, down 21.6%, and Texaco 1.486 million b/d, down 21.6%.

Nineteen companies reported lower natural gas production. This was due mainly to the sharp drop in U.S. demand for gas because of recession, warmer than normal weather, and conservation efforts.

Pennzoil Co. posted a sharp 26.6% drop to 358.9 MMcfd. Conoco experienced a decline of 19.2% to 751.9 MMcfd, and Unocal Corp. a drop of 16.7% to 982.5 MMcfd.

The group drilled 10,879.5 wells last year, down 3.1%. Overall success rate for 21 companies reporting was 80.3% for 9,178 wells drilled.

Exxon, with 1,565 wells drilled, had a success rate of 79.3%. Gulf drilled 993 wells with an 83.2% success rate, and Standard Oil Co. (Ind.) drilled 962 wells with an 80.7% success rate.

Crude runs to stills for the group fell 1.4% to 15.4 million b/d.

For 23 companies reporting refining capacity, utilization rate was a composite 70.6%. This group had a total worldwide capacity of 21 million b/d.

And for 22 companies reporting U.S. crude runs and capacity, the composite refinery utilization rate was 75.5%. Total capacity was 12 million b/d.

Utilization rates varied widely.

Atlantic Richfield Co. posted a rate of

How the 26 company

Rank by total assets	Company	Net 1983 Million $
1	Exxon	4,826.2
2	Mobil	1,503.0
3	Texaco	1,233.0
4	Standard Oil (Indiana)	1,868.0
5	Standard Oil of California	1,590.0
6	Atlantic Richfield	1,547.9
7	Shell Oil	1,633.0
8	Gulf Oil	978.0
9	Tenneco	716.0
10	Standard Oil (Ohio)	1,512.0
11	Phillips Petroleum	721.0
12	Sun	453.0
13	Occidental Petroleum	566.7
14	Getty Oil	494.3
15	Marathon Oil	*522.0
16	Unocal,	625.9
17	Conoco	+478.0
18	Amerada Hess	205.3
19	Diamond Shamrock	(56.2)
20	Superior Oil	241.8
21	Ashland Oil**	102.8
22	Kerr-McGee	118.4
23	Pennzoil	164.2
24	Murphy Oil	131.9
25	Louisiana Land & Explor.	94.0
26	American Petrofina	55.3
	Total	22,325.5

*As reported. May include nonrecurring
Oil of California. +Aftertax operating

...and a summary of

Rank by total assets	Company	Net liquids 1983 1,000 b/d
1	Exxon	*2,582.0
2	Mobil	*1,223.0
3	Texaco	*1,486.0
4	Standard Oil (Indiana)	786.0
5	Standard Oil of California	*1,371.0
6	Atlantic Richfield	694.7
7	Shell Oil	554.0
8	Gulf Oil	*1,718.0
9	Tenneco	123.6
10	Standard Oil (Ohio)	612.0
11	Phillips Petroleum	422.0
12	Sun	234.0
13	Occidental Petroleum	762.0
14	Getty Oil	408.2
15	Marathon Oil	246.9
16	Unocal*	243.5
17	Conoco	384.0
18	Amerada Hess	154.6
19	Diamond Shamrock	32.0
20	Superior Oil	78.6
21	Ashland Oil§	16.7
22	Kerr-McGee	35.7
23	Pennzoil	35.8
24	Murphy Oil	64.3
25	Louisiana Land & Expl.	37.8
26	American Petrofina	18.2
	Total	14,324.8

*Net production plus proportional interest
Sept. 30. Source: Oil & Gas Journal

group of firms performed financially

profits*— % change	—Total revenues†— 1983 Million $	% change	Net profit as % of —tot. rev.§— 1983	1982	—Working capital§— 1983 Million $	% change	Funds —from operations— 1983 Million $	% change	Capital & —expl. expend.— 1983 Million $	% change	% return stockholders' —equity§— 1983	1982	% return on total —assets§— 1983	1982	—Total assets— 1983 Million $	% change
+ 15.3	97,734.0	− 8.5	5.1	4.0	3,556.8	+ 6.9	10,053.5	− 1.0	9,000.0	−21.1	16.4	14.7	7.7	6.7	62,963.0	+ 1.1
+ 23.9	54,607.0	− 8.9	2.8	2.0	1,077.0	+101.7	3,724.0	+ 17.9	3,073.0	−19.6	10.8	8.8	4.3	3.4	35,072.0	− 0.4
− 3.7	41,147.0	−14.3	3.0	2.7	2,639.0	− 14.9	2,789.0	+ 3.6	3,833.0	− 9.1	8.4	9.0	4.5	4.7	27,199.0	+ 0.3
+ 2.3	29,494.0	− 1.0	6.3	6.1	1,062.0	+ 79.1	4,121.0	+ 5.3	4,091.0	− 7.8	15.0	16.0	7.2	7.5	25,805.0	+ 6.2
+ 15.5	27,342.0	−22.1	5.8	3.9	1,979.0	+ 15.5	3,720.0	− 1.8	3,330.0	−28.6	11.3	10.4	6.6	5.9	24,010.0	+ 2.2
− 7.6	26,279.3	− 4.3	5.9	6.1	812.7	+ 60.6	4,106.1	− 8.9	3,355.4	−15.1	14.2	17.0	6.6	7.7	23,282.3	+ 7.6
+ 1.7	20,705.0	− 0.4	7.9	7.7	434.0	+361.7	3,617.0	+ 4.2	2,253.0	−24.8	14.4	15.6	7.4	7.5	22,169.0	+ 3.7
+ 8.7	28,887.0	− 5.7	3.4	2.9	897.0	+130.6	2,685.0	− 9.9	2,770.0	−25.2	9.7	9.1	4.7	4.4	20,964.0	+ 2.6
− 12.6	14,449.0	− 3.5	5.0	5.5	194.0	− 7.6	2,020.0	− 9.9	1,609.0	−23.5	10.2	13.5	4.0	4.7	17,994.0	+ 3.5
− 19.5	12,515.0	−11.8	12.4	13.6	(23.0)	—	2,946.0	− 4.7	2,298.0	−15.1	18.7	26.0	9.2	11.7	16,362.0	+ 2.2
+ 11.6	15,411.0	− 3.0	4.7	4.1	22.0	− 88.8	1,393.0	+ 3.9	1,141.0	−46.5	11.7	11.2	5.5	5.3	13,094.0	+ 8.2
− 15.6	15,523.0	− 4.5	2.9	3.3	477.0	+ 99.6	1,736.0	− 11.2	1,294.0	−24.5	8.7	10.3	3.6	4.5	12,466.0	+ 5.2
+264.2	19,709.9	+ 9.3	2.9	0.9	76.4	− 86.1	1,795.7	+148.3	951.0	+ 2.2	12.2	3.2	4.8	1.0	11,775.4	−25.3
− 28.5	11,806.8	− 3.7	4.2	5.6	(125.7)	—	1,787.8	− 11.5	1,223.3	−34.2	7.1	13.5	4.8	7.0	10,385.1	+ 4.6
− 21.6	9,262.0	− 3.8	12.0	12.9	—	—	—	—	969.0	−10.1	—	—	5.6	7.3	◆9,332.0	+ 2.9
− 22.2	10,690.5	− 1.9	5.9	7.4	456.8	+ 54.2	1,799.2	− 9.5	1,751.0	−15.6	12.1	16.9	6.8	9.4	9,228.0	+ 8.4
− 25.0	22,356.0	+ 5.9	2.1	3.0	—	—	—	—	1,306.0	+14.6	—	—	5.2	6.9	◆9,107.0	− 1.0
+ 21.7	8,422.1	+ 0.3	2.4	2.0	744.5	+ 22.4	757.0	+ 13.5	726.4	−17.0	8.1	6.6	3.3	2.7	6,217.1	+ 1.2
—	4,035.3	+25.2	—	—	321.4	+ 2.6	476.9	+ 6.8	466.9	−29.3	—	—	—	—	6,024.4	+88.6
+ 8.2	1,793.3	−12.1	13.5	10.9	397.9	− 23.8	733.0	− 22.2	1,016.9	−22.5	9.8	9.7	4.6	4.5	5,267.0	+ 5.5
− 43.2	8,258.8	−10.9	1.2	2.0	79.5	− 47.8	293.2	− 22.9	322.1	−23.8	7.2	12.9	2.5	4.3	4,107.8	− 2.4
− 43.6	3,507.7	− 7.1	3.4	5.6	216.0	− 31.6	478.9	− 17.9	422.5	−22.8	6.8	12.5	3.1	5.6	3,806.9	+ 1.2
− 13.0	2,316.8	+ 2.1	7.1	8.3	515.3	+ 56.2	530.2	− 3.2	354.8	−41.5	10.7	15.3	4.6	5.8	3,584.3	+ 9.7
− 16.4	2,448.3	− 8.7	5.4	5.9	114.5	+147.8	383.1	− 41.7	471.4	−23.5	13.4	17.5	4.7	5.3	2,807.8	− 6.1
+ 23.2	1,254.3	+ 4.1	7.5	6.3	37.0	+ 67.4	353.0	− 9.4	266.8	−39.5	14.8	9.1	5.6	4.5	1,681.6	—
+ 1.7	2,088.5	− 7.6	2.6	2.4	89.5	− 29.9	152.5	+ 7.2	288.6	+85.8	9.5	9.7	4.0	4.7	1,399.3	+20.0
− 0.1	**500,043.6**	**−3.8**	**††6.0**	**††6.3**	**16,050.6**	**−46.0**	**53,051.1**	**−0.6**	**48,584.1**	**− 20.0**	**††12.3**	**††12.9**	**††5.6**	**††3.0**	**380,104.0**	**+2.3**

gains and losses. †Excludes excise taxes collected where possible. §Calculated by Oil & Gas Journal. ¶Operating revenue. ◆Identifiable assets. ‡Formerly Union income. **Fiscal year ended Sept. 30. ††Excludes Conoco and Marathon.

their worldwide operations

production— % change	Net natural —gas production— 1983 MMcfd	% change	—Net wells drilled— 1983 total	% change	—Crude runs to stills— 1983 1,000 b/d	% change	—Refined product sales— 1983 1,000 b/d	% change	—Liquids reserves— 1983 Million bbl	% change	—Natural gas reserves— 1983 Billion cu ft	% change
−16.7	*5,628.0	− 2.1	1,565.0	+ 14.8	3,496.0	+ 7.0	4,310.0	+ 5.5	6,478.0	− 2.1	29,279.0	+ 2.1
−21.6	2,427.0	− 8.0	584.0	− 6.7	1,594.0	− 6.8	2,034.0	− 2.9	2,148.0	− 4.7	18,327.0	+ 6.2
−21.6	1,855.0	−13.3	712.0	− 8.1	1,708.0	− 4.8	2,274.0	− 3.4	1,840.0	− 5.3	8,528.0	− 9.9
+ 2.6	2,630.0	− 5.7	962.0	+ 6.4	919.0	− 0.6	1,013.3	− 1.1	2,632.0	− 0.3	15,190.0	+ 0.9
−26.0	1,615.0	− 0.7	533.0	+ 15.9	1,433.3	− 7.2	1,715.0	− 7.8	1,643.0	+ 1.0	6,658.0	− 3.1
+ 8.1	1,350.0	+ 6.1	548.0	− 1.6	863.6	+ 5.2	800.5	+ 4.7	2,783.0	+ 2.7	14,741.0	− 1.6
+ 1.5	1,489.0	−11.1	600.0	− 28.9	874.0	+ 3.4	846.0	+ 4.3	2,237.0	− 1.0	7,688.0	+ 1.9
+ 4.5	1,462.8	−10.6	993.0	+ 13.9	938.6	− 8.6	1,110.7	− 6.7	2,046.0	+ 4.0	5,659.0	− 0.8
− 2.8	979.0	− 9.4	300.3	− 18.2	83.7	− 9.9	129.5	− 2.3	380.0	− 0.5	3,408.0	+ 0.4
−11.9	95.6	+ 5.4	95.7	− 17.1	393.7	+ 9.3	404.7	+ 9.1	2,818.4	− 1.3	6,246.5	− 2.3
+ 9.6	1,266.0	+ 0.5	268.0	− 17.8	260.0	− 6.1	505.0	− 1.6	1,048.0	+14.5	6,859.0	+ 2.7
− 3.2	828.0	−14.0	861.0	− 6.1	449.0	+ 2.6	586.4	—	780.0	− 0.4	3,410.0	− 6.2
−18.7	778.0	+292.9	253.0	+ 9.1	—	—	—	—	920.0	− 8.8	2,534.0	−24.2
− 1.9	755.3	−15.8	655.3	− 14.9	225.9	−17.7	363.6	+ 4.5	1,881.0	− 3.3	2,820.0	+ 2.9
+ 5.2	572.2	+ 0.8	278.0	− 2.5	374.3	− 4.7	431.1	− 2.2	1,096.1	+ 3.3	3,315.7	+ 1.8
+ 1.4	982.5	−16.7	276.0	− 18.1	380.3	+ 4.5	386.0	+ 6.0	856.0	− 1.8	6,365.0	− 0.4
− 3.2	751.9	−19.2	376.5	+ 11.5	470.0	+ 3.5	527.0	− 0.9	1,349.0	+ 0.1	2,925.0	− 5.2
+ 1.2	750.7	+41.1	85.0	− 8.6	341.0	−18.0	462.0	− 0.2	740.0	− 4.0	1,998.0	− 6.8
+207.7	263.1	− 6.1	122.6	− 34.0	37.7	+56.4	131.0	+45.1	120.2	+261.0	915.2	+ 4.1
− 2.4	823.1	−14.9	299.0	− 16.2	—	—	—	—	263.4	+21.2	4,250.0	− 3.8
+ 0.6	27.0	—	70.0	− 16.7	285.0	− 8.7	135.3	− 8.6	25.4	+43.5	208.2	− 1.1
+ 0.6	212.2	− 7.8	93.2	+138.9	119.1	+ 0.6	163.5	+ 3.9	146.0	+ 6.4	820.0	− 4.4
+ 0.6	358.9	−26.6	66.8	− 61.0	55.1	−13.8	61.9	−13.4	136.0	− 3.5	1,064.0	− 4.1
− 2.3	114.2	−13.2	141.2	+ 40.6	112.1	− 6.0	123.8	− 2.8	150.4	− 8.9	670.9	+10.8
+ 2.4	69.8	−10.4	19.6	+ 1.0	92.2	−12.3	50.8	−11.9	90.0	+ 5.5	286.0	−11.3
+ 2.8	53.0	− 5.2	121.3	+ 27.7	105.3	− 8.1	136.5	− 2.6	37.8	+ 6.5	211.4	−10.2
− 9.8	**28,137.3**	**−4.6**	**10,878.5**	**−3.1**	**13,378.8**	**−1.6**	**18,781.2**	**+0.1**	**34,880.7**	**+0.3**	**194,474.8**	**−0.8**

in equity companies and supplies available under long term agreements with foreign governments. *Formerly Union Oil of California. ¶Fiscal year ended

How selected other firms performed in 1983

Rank by total assets	Company	Net profits* 1983 Million $	Net profits* % change 1983/82	Total revenue 1983 Million $	Total revenue % change 1983/82	% return on total rev.† 1983	% return on total rev.† 1982	% return on stockholders' equity 1983	% return on stockholders' equity 1982	% return on total assets 1983	% return on total assets 1982	Total assets 1983 Million $	Total assets % change 1983/82
1	Williams Cos.	54.0	+ 57.4	2,167.0	+28.1	2.5	2.0	4.3	3.3	1.2	1.4	4,686.4	+97.8
2	Coastal	93.7	+ 42.8	5,963.1	+ 2.8	1.6	1.1	16.4	12.5	2.8	2.0	3,338.4	+ 3.5
3	Texas Oil & Gas§	295.7	+ 19.7	1,871.2	− 1.0	15.8	13.1	24.8	26.7	10.1	10.0	2,924.8	+18.8
4	Mesa Petroleum	125.9	− 3.0	422.1	+ 3.7	29.8	31.9	20.0	22.2	5.5	7.8	2,305.6	+38.3
5	Freeport-McMoRan	93.5	+ 41.7	643.3	+ 4.2	14.5	10.7	12.7	9.0	6.6	4.0	1,418.0	−14.5
6	Pogo Producing	23.9	− 53.4	232.4	−16.4	10.3	18.4	14.7	16.7	2.6	5.4	904.9	− 5.5
7	Inexco Oil	12.5	− 33.7	173.2	−20.4	7.2	8.7	4.8	7.5	1.5	2.2	824.1	− 2.9
8	Noble Affiliates	23.5	− 66.9	272.0	−33.7	8.5	18.6	5.7	18.1	3.2	9.9	720.1	+ 1.6
9	Southland Royalty	48.3	+ 68.5	321.4	−10.2	15.0	8.0	33.2	26.8	7.2	4.2	675.8	− 1.0
10	Lear Petroleum	19.0	+224.0	236.7	+15.4	8.0	2.9	9.8	7.0	2.9	1.4	661.0	+58.7
11	Crystal Oil	(10.9)	—	194.2	− 5.0	—	—	—	—	—	—	443.3	+ 4.9
12	Adobe Oil & Gas	23.8	− 41.0	165.5	−18.6	14.3	19.8	11.7	22.1	6.0	10.4	394.0	+ 1.8
13	Damson Oil¶	8.3	+ 35.1	85.6	+19.2	9.7	8.5	10.7	8.5	2.9	2.2	285.5	+ 4.1
14	Sabine	35.9	+ 55.0	109.6	−44.5	32.8	11.7	16.9	13.2	12.6	6.5	285.2	−20.6
15	Kirby Exploration	(14.7)	—	69.2	− 2.3	—	—	—	—	—	—	254.4	+ 6.9
16	Wainoco Oil	1.7	—	45.8	− 7.3	3.6	—	6.8	—	0.9	—	173.9	− 7.3
17	Northern Mich. Expl.	19.2	+ 2.7	90.4	− 4.9	21.2	19.6	16.2	17.8	11.1	12.4	172.2	+14.0
18	Fairmont Oil	16.7	+ 18.9	79.3	+27.5	21.1	22.6	13.9	13.5	10.4	8.9	160.3	+ 2.2
19	May Petroleum	(12.3)	—	33.8	+ 8.5	—	3.0	—	1.3	—	0.5	150.0	−18.1
20	Alamco	8.0	+ 21.5	33.1	+ 9.1	24.0	21.6	14.3	13.7	6.3	6.5	126.4	+25.3
	Total	**865.5**	**+ 12.4**	**13,208.9**	**+ 2.7**	**6.6**	**6.0**	**13.1**	**13.1**	**4.1**	**4.4**	**20,904.3**	**+19.7**

*As reported. May include extraordinary gains & losses. †Calculated by Oil & Gas Journal. §Fiscal year ended Aug. 31. ¶Fiscal year ended Sept. 30.
Source: Oil & Gas Journal

94.8%, followed by Getty at 90.5% and Diamond Shamrock at 88.2%. On the lower end of the scale, Socal had a worldwide utilization rate of 55%.

Also below 60% were Amerada Hess 59.3%, Pennzoil 59.7%, and Ashland Oil Inc. 59.8%.

Assets, expenditures. The effect of megamergers isn't reflected in the 1983 assets as posted by the OGJ group. There was no shift in the relative asset position of the top 10 firms.

Total assets for the group advanced 2.3% to $386.1 billion.

The largest changes in position on the asset list were Oxy, falling from 11th in 1982 to 13th in 1983, and Diamond Shamrock, moving up to 19th from 23rd.

Oxy's assets fell 25.3% to $11.8 billion. The firm sold substantial assets acquired from Cities in 1982, including refining, marketing, and transportation operations.

It was Oxy's intent to redeploy Cities' assets.

Diamond Shamrock boosted its assets 88.6% to $6 billion due almost entirely to the acquisition of Natomas Co. during 1983.

Only two companies bucked the group trend by boosting spending in 1983. Oxy's outlays were up 2.2% and American Petrofina Inc.'s up 85.8%.

The increased expenditures by American Petrofina were mainly for refinery upgrading.

The remaining companies cut spending anywhere from 7.8% (Standard of Indiana) to 48.5% (Phillips).

Exxon led the way with total 1983 capital and exploration spending of $9 billion, but this was down 21.1% from a year ago. Texaco followed with outlays of $3.8 billion, down 9.1%.

Other companies. Profits for a group of 20 other companies not included in the OGJ group were up 12.4% for 1983. Profits totaled $865.5 million on revenues of $13.2 billion, up 2.7%.

Financial performance of these companies varied substantially. Three of the firms posted losses.

Crystal Oil Co. had a loss of $10.9 million, Kirby Exploration Co. $14.7 million, and May Petroleum Co. $12.3 million.

In contrast, the largest company in this group, Williams Cos., had an increase in net profits of 57.4% to $54 million and a 28.1% increase in revenues.

Texas Oil & Gas Co. posted profits of $295.7 million, up 19.7%, despite a 1% drop in revenues. Coastal Corp. recorded a 42.8% improvement in earnings at $93.7 million. Mesa Petroleum Co. had the second highest profits on this list at $125.9 million, but this was down 3% from the previous year.

Return on stockholders equity for the group amounted to 13.1%, the same as 1982. Profits as a percent of total revenues moved up to 6.6% from 6% the previous year. But return on total assets dropped to 4.1% from 4.4%.

This group of companies increased total assets 19.7% in 1983.

The advance was led by Williams, whose assets increased 97.8% to $4.686 billion.

The near doubling in size was due mainly to the acquisition of Northwest Energy Co.

Lear Petroleum Co. assets increased 58.7% to $661 million, and Mesa grew by 38.3% to $2.305 billion.

Seven companies reported a drop in total assets during 1983.

Sabine Corp. posted the sharpest decline—20.6% to $285.2 million. During 1983, the firm sold its Canadian operations and some real estate. The object was to become a more efficient company, concentrating on reserves growth.

The horizon. The U.S. economy came out of the recession in 1983 with real (constant 1972 dollars) gross national product increasing 3.4%. And real growth rate in the first quarter last year was an outstanding 8.8%/year.

That growth was expected to continue throughout 1984, but at a slower pace.

After 4 years of declining consumption, energy demand was expected to increase in 1984 to fuel the growth in economic activity.

Demand for petroleum products was expected to increase after 5 consecutive years of decline.

And natural gas demand was expected to rebound from the low level of 1983. Colder weather during first quarter 1984 pushed consumption an estimated 6.5% ahead of a year earlier.

There still is substantial excess crude production capacity worldwide that can put downward pressure on prices. But prices firmed during 1983. Stock withdrawals in the major industrialized countries have ceased.

Members of the Organization of Petroleum Exporting Countries have managed to maintain relative adherence to their production quota.

In addition, disruption of tanker traffic in the Persian Gulf due to the Iran/Iraq war may slow exports from that area.

A good proportion of inefficient crude capacity has been eliminated by refiners. Crude runs will increase with increased demand for products, and refiners margins should continue to improve.

Companies have continued to invest at a relatively high level, and a number of firms have disclosed plans for increased spending for 1984.

It adds up to a year of recovery for the petroleum industry in 1984. ◆

Non-Communist pipeline construction in 1985

Area	*4-10 in.	12-20 in.	22-30 in.	Larger than 30 in.	Total
	Miles				
GAS PIPELINES					
U.S.	1,464	707	435	263	2,869
Canada	1,740	6	—	183	1,929
Latin America	108	58	—	93	259
Asia-Pacific	443	1,530	440	367	2,780
Western Europe	797	745	273	806	2,621
Middle East	53	19	91	410	573
Africa	—	28	260	620	908
Total gas	**4,605**	**3,093**	**1,499**	**2,742**	**11,939**
CRUDE PIPELINES					
U.S.	334	111	27	—	472
Canada	100	365	231	—	696
Latin America	—	170	51	—	221
Asia-Pacific	21	—	—	—	21
Western Europe	—	—	280	—	280
Middle East	485	6	354	60	905
Africa	611	591	211	—	1,413
Total crude	**1,551**	**1,243**	**1,154**	**60**	**4,008**
PRODUCTS PIPELINES					
U.S.	170	364	500	18	1,052
Canada	15	301	—	—	316
Latin America	360	120	—	—	480
Asia-Pacific	117	—	—	—	117
Western Europe	48	—	—	—	48
Middle East	239	75	—	—	314
Africa	—	—	—	—	—
Total products	**949**	**860**	**500**	**18**	**2,327**
NON-COMMUNIST WORLD TOTALS					
Gas	4,605	3,093	1,499	2,742	11,939
Crude	1,551	1,243	1,154	60	4,008
Products	949	860	500	18	2,327
Total	**7,105**	**5,196**	**3,153**	**2,820**	**18,274**

* Includes some projects of less than 4 in.

Elsewhere:

- A group led by Atlantic Richfield Co. and Chevron Corp. is moving ahead with plans for the Southern California Pipeline System, a $350 million pipeline to link more than 300,000 b/d of oil production from California's biggest offshore and onshore oil provinces with the Los Angeles area.

Plans call for a 260 mile, 30 in. common carrier line to transport about 200,000 b/d of Santa Barbara Channel production and 130,000 b/d from the San Joaquin Valley in Kern County, Calif. Start-up could take place late in 1988.

The line could be expanded to accommodate as much as 500,000 b/d of oil.

- Husky Oil Operations Ltd., Calgary, has started construction of three heavy oil pipeline projects in Alberta and Saskatchewan.

The lines, all associated with Husky's Biprovincial Project, will cost about $47 million.

Corvette Construction, Coronation, will build the $25 million Phase 3 section of the Cold Lake pipeline. The dual system is made up of 52 miles of 6 in. diluent line and a 12 in. blend line, connecting Cold Lake field with Husky's existing line in the Morgan-Lindbergh area.

Leonard Pipeline Construction, Calgary, will lay a $20 million loop on Husky's Lloydminster-Hardisty main line system, with the addition of a 50 mile, 16 in. blend line between Lloydminster and Wainwright terminals.

And Hat Pipeline Construction, Kindersley, Sask., will lay a $2 million loop on Husky's Saskatchewan gathering system, which will add 7 miles of 12 in. blend line in the Waseca-Big Gully area.

- Mereenie field partners in Australia's Northern Territory let contract to Bechtel Pacific Corp. Ltd. to survey and design a 156 mile, 8 in. pipeline to link Mereenie with Alice Springs. Although construction hasn't begun, the group plans to have the line on stream this year.

- A group led by Santos Resources Pty. Ltd. started up its 495 mile, 12 in. Jackson-Moonie crude line in Queensland, Australia.

The $100 million line moves oil from Jackson field in Southwest Queensland to Moonie, where it connects with an existing line to Brisbane on the Australian coast.

Initial flow was about 16,000 b/d. The line was designed to allow expansion to 55,000 b/d.

- Construction was scheduled to begin in late 1984 on a 184 mile line to link Canon Limon field in Northeast Colombia's Llanos basin with the trans-Andean trunk line at Rio Zulia near Cucuta, Colombia.

The $170 million line will be able to move 90,000 b/d and can be expanded to 250,000 b/d. Occidental Petroleum Corp. and state owned Empresa Colombiana de Petroles let contract to Mannesman Anlagenbau AG, Dusseldorf, and International Management & Engineering Group Ltd., London, to construct the line.

Gas pipelines. Much of the activity in gas line construction involves plans to boost Canadian gas exports to the U.S.

For example, a combine of ANR Pipeline Co.-InterNorth Inc.-Northern Border Pipeline Co., TransCanada PipeLines Ltd., and Natural Gas Pipeline Co. of America (NGPL) propose competing projects to move gas from western Canada to U.S. Northeast markets.

The ANR-InterNorth-Northern Border proposal is to lay a 36 in. pipeline from Northern Border's terminus at Ventura, Iowa, to Sandwich, Ill., where it would connect with ANR's system. A 373 mile pipeline would be laid from Defiance to Leidy, Pa.

Total cost of the project, which could start up in 1986, would be about $1 billion.

NGPL's proposal calls for a 146 mile line from the Northern Border terminus at Ventura to NGPL's system at Harper, Iowa. NGPL says the proposal, also aiming for a 1986 start-up, would cost about half as much as the ANR-InterNorth proposal, resulting in transportation costs that are about half that of the ANR-InterNorth proposal.

TransCanada plans to expand its existing system from the Alberta-Saskatchewan border to Ontario. The gas would then move to Toronto, where a new line would be constructed from Niagara Falls to Leidy.

Off Canada's east coast, Mobil Oil Canada Ltd. plans to lay a line from its Venture field off Nova Scotia to New Brunswick. Tennessee Gas Pipeline Co., which agreed to buy Mobil's production, plans to lay a line to the Maine-New Brunswick border to move the gas into its system.

And NESP Supply Corp., whose members are Texas Eastern Transmission Corp., Algonquin Gas Transmission Co., and Transcontinental Gas Pipe Line Corp., plans to lay a line to take Petro-Canada's production from Venture field.

Non-Communist pipeline construction in 1985 and beyond*

Area	†4-10 in.	12-20 in.	22-30 in.	Larger than 30 in.	Total
	Miles				
GAS PIPELINES					
U.S.	2,815	1,443	1,282	4,132	9,672
Canada	3,020	130	15	1,536	4,701
Latin America	1,382	1,766	1,618	368	5,134
Asia-Pacific	910	2,397	821	367	4,495
Western Europe	877	1,437	523	1,079	3,916
Middle East	188	22	94	410	714
Africa	200	233	345	1,234	2,012
Total gas	**9,392**	**7,428**	**4,698**	**9,126**	**30,644**
CRUDE PIPELINES					
U.S.	475	261	1,487	1,030	3,253
Canada	228	540	231	1,400	2,399
Latin America	99	507	51	—	657
Asia-Pacific	230	—	873	187	1,290
Western Europe	174	—	280	—	454
Middle East	522	880	2,120	122	3,644
Africa	754	591	1,102	—	2,447
Total crude	**2,482**	**2,779**	**6,144**	**2,739**	**14,144**
PRODUCTS PIPELINES					
U.S.	530	1,054	540	18	2,142
Canada	211	307	28	—	546
Latin America	1,217	1,687	—	—	2,904
Asia-Pacific	482	576	—	—	1,058
Western Europe	96	130	—	—	226
Middle East	364	111	—	—	475
Africa	1,464	—	—	—	1,464
Total products	**4,364**	**3,865**	**568**	**18**	**8,815**
NON-COMMUNIST WORLD TOTALS					
Gas	9,392	7,428	4,698	9,126	30,644
Crude	2,482	2,779	6,144	2,739	14,144
Products	4,364	3,865	568	18	8,815
Total	**16,238**	**14,072**	**11,410**	**11,883**	**53,603**

* Projects planned or under way. † Includes some projects of less than 4 in.

Meanwhile, the proposed 4,790 mile Alaskan Natural Gas Transportation System (Angts) to bring Prudhoe Bay gas to the Lower 48 is all but dead. Angts partners InterNorth Inc. and Columbia Gas Systems Inc. in 1984 withdrew from the project.

Elsewhere:

- Arkansas Louisiana Gas Co. plans to expand its pipeline system in three states so it can sell gas to Southern Natural Gas Co.

The $232.2 million project calls for work in Arkansas, Louisiana, and Oklahoma in three phases. Completion is scheduled for late 1987.

Phase 1 calls for laying of 112 miles of 30 in. pipe from Clark County, Ark., to Sonat's Perryville compressor station in Ouachita Parish, La., and 24 miles of 30 in. loop in Logan and Yell counties, Ark.

Phase 2 covers more than 16 miles of 30 in. loop between the Chambers compressor station in Yell County and the Perla regulator station at Hot Springs, Ark..

Phase 3 calls for more than 48 miles of 36 in. loop in Latimer County, Okla., 34 miles of 30 in. loop between Perla and Hot Springs, Ark., and 10 miles of 24 in. loop in Columbia County, Ark.

- The 52 mile Phase 1 of the 24 in. Seagull Shoreline System along the Texas Gulf Coast was started up. When completed, it will be a 258 mile, 24 in. system in state waters running parallel to the Texas coast from north of Brownsville, to a point east of Galveston. Capacity will be more than 400 MMcfd.
- NGPL plans to lay a 185 mile, 24 in. line across North Texas to link its existing Amarillo and Gulf Coast gas lines.

The line also will connect with the Texoma Pipeline.

Initial capacity of the NGPL line will be 200 MMcfd, with capacity increases possible. Construction is to begin during 1985.

- Construction started on the Alabama Intrastate Supply System, an 84 mile gas gathering and 70 mile, 16 in. transmission system to connect Black Warrior basin wells in western Alabama with the Birmingham, Ala., distribution system of Alabama Gas Corp.

Alabama Intrastate Gas Corp. is a subsidiary of Texas Oil & Gas Corp., Dallas.

- India plans a 1,100 mile, 18 and 36 in. line across the subcontinent to transport gas from Bombay High field to six fertilizer plants. The line will run from Surat north of Bombay to Bareilly near the border with Nepal. Construction, scheduled to begin during 1985, will take 5 years.
- Shell Exploration & Production is laying a 186 mile, 20 in. line to link Fulmar field in the U.K. North Sea with Scotland. Saipem SpA's Castoro Sei semisubmersible lay vessel is laying the line from Shell's Platform A in Block 30/16 to St. Fergus. Work is scheduled to end in 1985.
- Sonatrach let contract to Saipem SpA to lay a 330 mile, 48 in. loop on the southern portion of Sonatrach's trans-Mediterranean gas pipeline. Construction is expected to take 24 months.
- The 6 year old Polar Gas Project again revised its proposed pipeline to move gas from the Mackenzie Delta to northern Alberta.

The Polar Gas group now plans to lay a 36 in. line starting at Taglu field on Richards Island, N.W.T., to Edson, Alta.

A 24 in. supply lateral about 15 miles long would run from Parsons Lake field to the trunk line. Construction is scheduled to begin in 1987, aiming for 1991 completion.

Products pipelines. A large portion of products line construction involves carbon dioxide pipelines.

Two major CO_2 lines from Colorado and New Mexico to West Texas were completed in 1984. Amoco Production Co.'s 210 mile, 20 in. Bravo Pipeline System was dedicated.

Meanwhile, Shell Oil Co. and Amerada Hess Corp. have proposed new CO_2 lines.

Shell let contract to Humble Pipeline Constructors Inc., Humble, Tex., to lay a 94 mile, 20 in. CO_2 line from its Jackson Dome field, Scott and Franklin counties, Miss., to enhanced oil recovery projects in West Mallalieu field, Lincoln County, Miss., and Little Creek fields, Lincoln and Pike counties, Miss. The line, to be completed in 1985, is being designed to extend to South Louisiana.

Amerada Hess is in the early stages of a pipeline project to transport CO_2 from the Great Plains coal gasification plant near Beulah, N.D., to EOR projects in the Williston basin of North Dakota and Montana.

The plan is to lay a 230 mile line of 12-16 in. pipe.

Construction might start in 1986, with completion scheduled later in the year.

Elsewhere, Southern Pacific Pipe Lines Inc. completed construction of a 145 mile, 12 in. products pipeline to link refineries in the San Francisco Bay area with markets in and around Fresno, Calif.

Macco Construction Co. laid the line. Capacity is about 750,000 b/d. ■

Interstate contracts, construction costs flatten

THE U.S. INTERSTATE PIPE line network shrunk in 1983 as construction costs flattened.

The OGJ-Morgan composite gas pipeline cost index for 1983 was 192, compared to 190 for 1982. And the OGJ-Morgan composite oil pipeline cost index for 1983 was 212 compared to 210 for 1982. Reports to the Federal Energy Regulatory Commission (FERC) for 1983 by the interstate crude oil, refined products, and natural-gas pipeline companies showed a net decrease of more than 6,525 miles of pipeline, for a total of 453,023 miles (Table 1).

Crude oil and gathering systems contracted in 1983, while products lines expanded. Net liquids trunk lines declined. By the same token, natural gas transmission and field lines shrunk while storage lines remained flat. Total natural gas miles of pipeline remained flat.

The Oil & Gas Journal's Worldwide Construction Report (OGJ, Oct. 29, 1984) lists a total of 108 individual pipeline projects totaling more than 10,240 miles of pipeline either planned or under way for the U.S.

Natural gas pipeline projects add up to 86 involving more than 6,300 miles of

PIPE MAKE-UP AREA for Offshore California's Pitas Point gas pipeline.

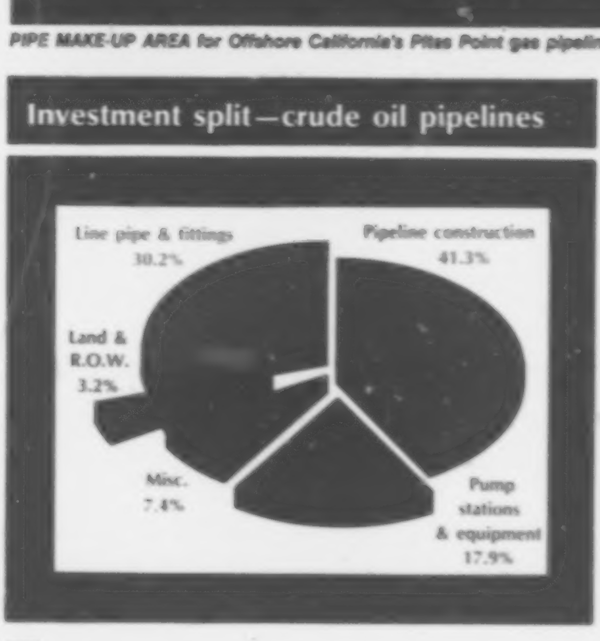
Table 1

U.S. interstate pipeline mileage

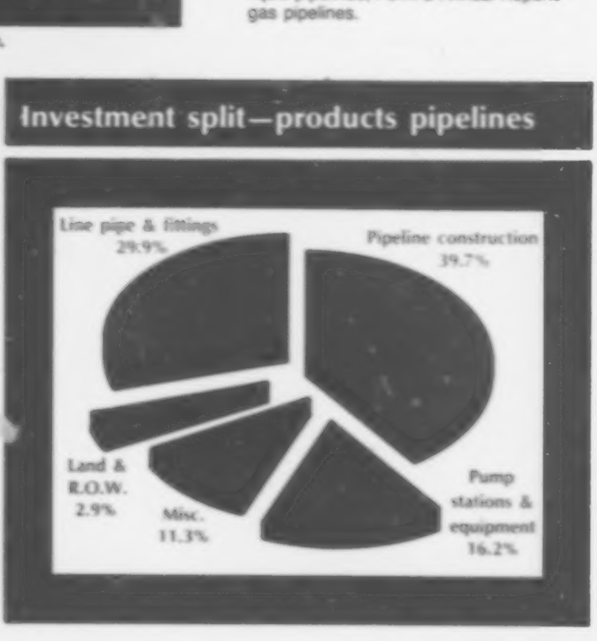
Year	Miles Gas	 Liquid	 Total
1972	246,551	173,532	420,083
1973	248,773	170,691	419,464
1974	246,872	173,341	420,213
1975	255,792	172,680	428,472
1976	254,548	174,072	428,590
1977	256,198	170,948	427,146
1978	258,576	162,452	421,028
1979	264,134	169,794	433,928
1980	274,248	172,673	446,921
1981	274,634	172,815	447,449
1982	286,999	172,549	459,548
1983	285,204	167,819	453,023

Source: FERC Form 6 Annual Reports-liquid pipelines; Form 2 Annual Reports-gas pipelines.

Investment split—crude oil pipelines



Investment split—products pipelines



pipeline, either planned or underway. Products pipeline projects are second in number, with 15 projects comprising 1,714 miles, and crude oil pipeline projects are third in number (7 projects) but second in number of miles of pipeline planned or under way at more than 2,100 miles.

U.S. interstate network. One measure of the U.S. interstate pipeline network is a tabulation compiled from reports filed with FERC by the regulated interstate liquids and gas pipelines for 1983. As indicated earlier and shown in Table 1, the total mileage adds up to 453,023 miles. This breaks down to 167,819 miles of liquids pipelines and 285,204 miles of natural gas pipelines.

Reports filed at the end of 1982 show a total of 459,548 miles, including 172,549 miles of liquids pipelines and 286,999 miles of natural gas pipelines. The mileages for 1983 and 1982 are not directly comparable, as the number of companies required to file reports with FERC varies slightly each year. The mileage for 1983 represents 141 liquids

Table 2

Investment in liquids pipelines

Item	Company and investment, $ A	B	C	D	E	Total, $	Percent
CRUDE PIPELINES INVESTMENT BY FIVE COMPANIES							
Land	1,468,224	895,868	294,320	948,735	1,159,965	4,767,112	0.31
Right-of-way	12,080,048	1,237,983	316,178	15,802,972	14,351,156	43,788,337	2.87
Line pipe	130,340,901	31,096,721	12,803,882	88,210,615	149,088,884	411,541,003	26.97
Line pipe fittings	6,972,344	2,027,998	1,879,069	16,508,084	22,113,620	49,502,015	3.24
Pipeline construction	178,345,466	33,406,577	17,160,817	203,437,511	197,350,403	629,700,774	41.25
Buildings	11,249,674	5,508,758	2,575,046	11,533,816	7,953,832	38,821,126	2.54
Pumping equipment	17,343,366	6,690,794	2,582,712	15,958,844	46,338,920	88,914,636	5.82
Machine tools and machinery	....	....	....	33,140	1,170	34,310	....
Other station equipment	63.633,154	18,957,644	4,772,257	39,427,193	19,522,995	146,313,243	9.58
Oil tanks	13,934,528	8,653,854	5,678,530	15,955,528	23,297,398	67,519,838	4.42
Delivery facilities	....	1,806,208	5,246,130	2,393,965	6,029,507	15,475,810	1.01
Communication systems	410,903	2,786,691	4,709	9,532,611	2,666,896	15,401,810	1.01
Office furniture & equipment	354,370	191,541	148,979	553,327	887,503	2,135,720	0.14
Vehicles & other work equip.	5,452,807	1,781,769	432,891	4,916,227	201,419	12,785,113	0.84
Other property	....	....	....	....	50,223	50,223	....
Total	**441,585,785**	**115,042,406**	**53,896,420**	**425,212,568**	**491,013,891**	**1,526,751,070**	**100.00**
PRODUCT PIPELINES INVESTMENT BY FIVE COMPANIES							
Land	4,352,111	1,757,007	356,126	852,997	2,541,839	9,860,080	0.36
Right-of-way	27,626,723	10,817,087	16,755,839	8,364,310	6,652,670	70,216,629	2.57
Line pipe	338,057,851	67,538,542	104,745,668	85,186,900	105,365,038	700,893,999	25.70
Line pipe fittings	71,156,522	12,495,632	13,125,816	1,577,520	15,204,740	113,560,230	4.16
Pipeline construction	553,332,115	108,293,277	185,909,629	92,955,444	142,740,568	1,083,231,033	39.70
Buildings	22,913,281	3,772,152	3,867,131	9,969,257	15,668,355	56,190,176	2.06
Pumping equipment	45,448,464	5,720,747	29,217,899	27,555,183	21,883,691	129,825,984	4.76
Machine tools & machinery	....	....	....	....	250,172	250,172	....
Other station equipment	113,791,166	20,040,168	29,939,900	22,666,237	70,160,697	256,598,168	9.41
Oil tanks	47,835,026	16,839,110	7,270,267	17,437,248	36,724,290	126,105,941	4.63
Delivery facilities	....	....	9,455,339	10,601,616	32,256,557	55,313,512	2.03
Communication systems	778,630	250,090	1,884,556	7,730,761	....	10,644,037	0.39
Office furniture & equipment	8,879,407	1,184,253	859,234	447,697	414,313	11,784,904	0.43
Vehicles & other work equip.	4,568,208	1,402,140	4,863,574	1,722,175	1,214,165	13,770,262	0.50
Other property	72,513,283	....	17,626,565	....	....	90,139,848	3.30
Total	**1,311,252,787**	**250,110,205**	**425,877,543**	**287,067,345**	**454,077,095**	**2,728,384,975**	**100.00**

Source: FERC Form 6 pipeline annual reports—1983.

pipeline companies and 112 natural gas companies, while the mileage for 1982 represents 139 liquids pipeline companies and 103 natural gas companies.

Table 1 also lists the total miles of interstate liquids and natural gas pipelines from 1972 through 1983.

At the end of 1983, the reports from the liquids pipeline companies show a total of 30,966 miles of gathering lines, 57,466 miles of crude oil trunk lines, and 79,387 miles of products pipelines.

Similarly, the reports filed for 1983 by the interstate natural gas pipeline companies show a total of 203,403 miles of transmission lines, 75,095 miles of field lines, and 6,706 miles of storage lines.

Deliveries. Analysis of reports filed with FERC by the interstate natural gas and liquids pipeline companies for 1983 shows that the 141 liquids pipelines delivered slightly more than 6 billion bbl of crude oil and 4.3 billion bbl of refined products for a total of 10.3 billion bbl of liquid hydrocarbons.

Trunkline traffic, however, leaped ahead of 1982. Traffic totaled 2,873,157 million bbl-miles of crude oil and 1,804,070 million bbl-miles of products, for a total trunkline traffic of 4,677,227 million bbl-miles. This reflects a sharp increase of 1,248,123, or 36.5%, compared to the amount reported for 1982.

For the same period in 1982, the 139 liquids pipeline companies reporting delivered 5.9 billion bbl of crude oil and 4.2 billion bbl of products, for a total of 10.1 billion bbl of crude oil and products, or about 2% less than that delivered in 1983.

Natural gas sales by the 112 natural gas companies reporting for 1983 were slightly more than 14.3 trillion cu ft, compared to 16.4 trillion cu ft sold by the 115 gas companies reporting for 1982, or a decrease of 2.1 trillion cu ft, or 12.8%. Since 1981, then, natural gas sales have declined by 4.2 trillion cu ft, or 22.7%, while crude oil and product deliveries for the same period have remained flat.

Investment and revenue. The interstate common-carrier crude oil and products pipeline companies reported an investment in carrier property for 1983 of $22.2 billion compared to $21.9 billion for 1982, an increase of $312,938, or 1.4%.

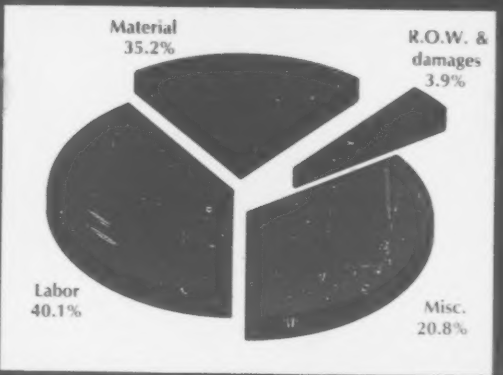
Operating revenue reached $7.4 billion in 1983 for the liquids pipeline companies. This is an increase of more than $331 million, or 4.6%, compared to 1982. The liquids pipeline companies reporting to FERC for 1983 showed a net income of $2.35 billion for 1983, compared to $2.16 billion for 1982, or an increase of $190.3 million, or 8.8% compared to 1982. Net income as a percentage of investment in carrier property was 10.6% in 1983 compared to 9.9% in 1983.

The interstate natural gas companies

10-year onshore construction-cost trend

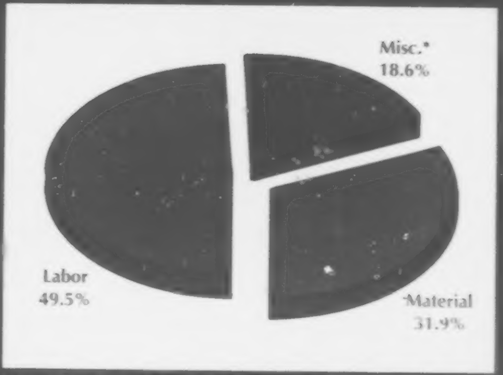
		Average cost, $/mile					Range, $/mile	
Size	Year*	R.O.W.	Material	Labor	Misc.	Total	Low	High
8-in.	1984	22,339	49,974	175,733	74,086	322,132	223,767	540,655
	1983	6,244	48,392	89,600	23,088	167,324	159,940	178,020
	1982	8,996	46,002	67,950	31,769	154,717	73,596	572,926
	1981	8,119	34,860	23,528	20,884	87,391	55,981	109,078
	1380	8,247	39,040	102,839	13,036	163,162	149,926	200,554
	1979	1,189	40,692	63,518	14,951	123,350	50,374	581,916
	1978	1,590	32,123	30,554	8,660	72,927	61,614	109,956
	1977	1,403	34,423	27,002	8,963	71,791	28,844	126,063
	1976	....	....	....	....	....	....	....
	1975	2,561	11,948	29,915	8,732	53,155	37,898	75,896
12-in.	1984	23,035	147,750	211,783	93,481	476,050	338,872	608,685
	1983	5,135	91,492	73,042	20,754	190,423	177,050	218,265
	1982	10,536	84,972	102,390	32,173	230,071	130,252	669,227
	1981	3,855	71,444	65,613	11,861	152,773	55,981	369,018
	1980	2,610	54,235	41,089	14,111	112,045	78,428	901,282
	1979	1,590	46,062	47,283	7,121	102,056	96,822	158,185
	1978	6,697	55,362	61,919	13,830	137,808	(†)	(†)
	1977	4,332	34,429	22,658	4,573	65,992	53,839	177,694
	1976	....	....	....	....	....	....	....
	1975	2,135	20,908	24,401	3,396	50,841	44,909	52,249
16-in.	1984	15,106	131,139	111,234	82,747	340,226	231,790	363,718
	1983	31,542	337,088	929,969	278,159	1,576,758	447,890	2,370,748
	1982	6,278	104,319	113,380	21,936	245,913	175,715	430,841
	1981	9,203	110,684	133,968	40,424	294,279	140,674	590,112
	1980	7,404	74,571	57,681	18,050	157,706	118,085	471,972
	1979	....	....	....	....	....	....	....
	1978	7,506	54,936	54,117	12,552	129,111	86,898	203,721
	1977	3,635	50,574	32,260	9,347	95,817	68,897	145,916
	1976	3,248	80,373	26,575	9,419	119,615	(†)	(†)
	1975	1,512	29,290	19,629	4,367	54,798	45,001	121,922
20-in.	1984	16,735	175,406	190,088	63,302	445,531	226,415	616,250
	1983	12,682	147,354	154,811	46,073	360,934	237,600	476,104
	1982	12,284	124,148	128,148	30,649	295,229	210,378	482,464
	1981	8.556	122,659	114,147	30,370	275,732	227,679	1,741,597
	1980	11,470	130,438	73,751	48,213	263,872	157,947	533,265
	1979	....	....	....	....	....	....	....
	1978	3,235	101,052	83,810	12,346	200,443	153,959	242,685

Onshore pipeline construction costs



*Includes engr., supv., adm. & overhead, interest, contingencies & FERC filing fees.
Source: FERC construction permit applications, 6-1-83-6-1-84.

Offshore pipeline construction costs



*Includes engr., supv., adm. & overhead, interest, contingencies & FERC filing fees.
Source: FERC construction permit applications, 6-1-83-6-1-84.

Table 3

Size	Year*	Average cost, $/mile R.O.W.	Material	Labor	Misc.	Total	Range, $/mile Low	High
	1977	5,415	95,045	85,842	16,044	202,346	110,349	312,337
	1976	....	....	....	....	....	....	....
	1975	7,258	53,951	37,251	18,134	116,593	101,674	155,982
24-in.	1984	29,133	289,487	298,521	128,390	745,531	395,676	1,772,049
	1983	31,416	310,583	501,401	148,993	995,393	608,781	1,649,454
	1982	28,537	508,226	807,847	120,895	1,465,505	(†)	(†)
	1981	30,078	269,414	395,204	127,790	822,486	350,898	826,088
	1980	14,220	162,019	152,406	52,114	380,759	230,122	820,295
	1979	5,268	152,878	193,227	19,206	370,579	(†)	(†)
	1978	2,372	112,790	125,435	17,045	257,642	239,480	371,932
	1977	....	....	....	....	....	....	....
	1976	4,784	95,656	94,319	29,755	224,514	(†)	(†)
	1975	4,306	75,126	38,115	18,189	135,736	130,939	139,833
30-in.	1984	20,885	336,043	376,631	183,034	916,592	637,546	1,413,826
	1983	23,872	253,071	348,478	116,084	741,506	660,086	1,683,143
	1982	20,756	296,737	362,787	93,103	773,383	548,396	1,179,760
	1981	14,135	309,364	201,037	73,281	597,817	561,358	4,684,745
	1980	13,206	227,229	134,491	46,018	420,944	319,482	921,772
	1979	25,884	239,454	290,474	35,752	591,560	529,178	604,298
	1978	12,231	187,718	216,264	20,895	437,108	(†)	(†)
	1977	6,485	147,814	91,862	22,469	268,630	266,513	270,684
	1976	22,456	112,497	96,141	19,750	250,844	168,029	471,679
	1975	17,267	92,819	123,824	19,981	261,730	179,445	414,866
36-in.	1984	36,063	358,876	362,667	152,787	910,393	665,480	2,143,680
	1983	51,436	498,047	490,568	306,666	1,346,717	703,112	2,724,493
	1982	13,429	375,281	176,287	58,733	623,730	615,160	833,546
	1981	5,948	344,374	358,072	74,415	782,809	693,945	1,573,759
	1980	20,677	344,664	268,753	87,850	721,944	528,710	1,105,515
	1979	20,654	272,397	203,639	57,814	554,504	443,024	682,280
	1978	26,441	199,878	150,667	65,439	442,425	(†)	(†)
	1977	20,101	209,878	115,498	18,366	363,843	(†)	(†)
	1976	....	....	....	....	....	....	....
	1975	12,567	118,579	94,095	10,929	236,170	194,960	355,962

*1975-1978 based on completed costs reported to FERC by fiscal year; 1979-1982 by calendar year. 1983-84 based on FERC construction permit applications, by fiscal year. †One report only.

under the jurisdiction of FERC reported an industry gas plant investment total of more than $45.8 billion at the end of 1983 compared to more than $43.2 billion at the end of 1982. This represents an increase for 1983 of $2.6 billion, or 6% compared to 1982.

These companies reported an operating revenue total of more than $66.2 billion for 1983, compared to $64.8 billion in 1982. They also reported a total net income of $3.565 billion for 1983, compared to $3.566 billion in 1982. Net income as a portion of gas plant investment dropped to 7.7% for 1983 from 8.3% for 1982 and 9.7% for 1981.

As shown in Table 2, the investment in the five crude oil pipelines stood at $1,526 million at the end of 1983, which compares with $1,493 million for 1982, for an increase of $33.6 million or an increase of just over 2.25%.

The investment in the five products pipeline companies the Journal has been tracking was just over $2,728 million at the end of 1983 compared to $2,701 million at the end of 1982, an increase of just over $27 million or 1% during 1982.

Figs. 1 and 2 illustrate the major investment split in the crude oil and products pipeline companies. As the charts show, the major investment is in pipeline construction: 41.3% for the crude oil pipelines and 39.7% for the products pipelines. Line pipe and fittings account for about 30% for both crude oil and products pipeline investment, while pump stations and equipment account for 17.9% of the investment in crude oil pipelines and 16.2% for products pipelines.

Construction costs. As the accompanying charts show, the cost of line pipe and fittings and the cost of laying pipelines add up to 70-72% of the cost of a pipeline system. These elements of pipeline construction costs continue to rise each year.

The OGJ-Morgan Oil Pipeline Index for 1983 and the OGJ-Morgan Gas Pipeline Cost Index for 1983 show that the composite oil pipeline cost index increased from 150 at the end of 1978 to 212 at the end of 1983, an increase of 41.3% in 5 years, while the composite gas pipeline cost index rose from 122 in 1978 to 192 at the end of 1983, an increase of 57.4%.

These data indicate that in 4-5 years, the cost of constructing pipelines could double. For the past 2 years, however, cost increases have been virtually flat: For oil pipelines, the index was 210 for 1982 and 212 for 1983; for natural gas pipelines, 190 for 1982, 192 for 1983.

Current pipeline costs

			$					
Size, in.	Location	Miles*	Material	Labor	Misc.†	R.O.W. & damages	Total	$/mile
ONSHORE PIPELINES								
4	Kentucky	0.50	19,400	7,800	3,800	100	31,100	62,200
6	Texas	0.24	23,376	55,863	899	—	79,239	330,163
6	Tennessee*	0.60	60,100	142,000	25,751	1,500	260,751	434,585
8	Connecticut*	7.40	501,000	1,591,100	765,377	356,000	3,213,377	434,240
8	Massachusetts	10.00	687,000	2,359,000	1,067,553	393,000	4,506,000	450,655
8	W. Virginia	21.50	756,000	2,886,000	1,049,000	120,000	4,811,000	223,767
10	Massachusetts*	7.00	620,000	2,047,000	913,695	338,000	3,918,000	559,814
10	New Hampshire*	10.50	940,000	2,710,000	1,228,114	337,000	5,215,114	496,678
12	Tenn., Va.*	2.20	474,700	498,400	231,804	2,600	1,207,504	548,865
12	Tennessee*	2.50	561,000	560,100	269,104	12,800	1,403,004	561,202
12	New Hampshire*	6.20	757,000	1,929,000	889,846	198,000	3,773,846	608,685
12	Virginia*	6.80	1,449,300	1,407,200	678,912	6,600	3,542,012	520,884
12	Massachusetts*	13.20	1,594,000	3,801,000	1,810,797	599,800	7,805,597	591,333
12	Oklahoma	21.10	2,847,000	2,817,000	980,587	378,000	7,022,587	332,824
16	Pennsylvania§	3.24	178,300	532,000	37,000	3,700	751,000	231,790
16	Tenn., Ark.	24.00	4,566,898	2,475,960	1,254,378	432,000	8,729,236	363,718
16	Okla., Tex.§	148.19	18,259,800	16,505,900	13,224,927	2,214,300	50,204,927	338,788
20	Missouri*	5.30	476,000	541,000	133,000	50,000	1,200,000	226,415
20	Maryland§	5.60	1,400,800	1,403,000	505,200	310,000	3,619,000	646,250
20	Arizona*	7.50	1,050,000	1,086,000	686,126	34,000	2,856,126	380,817
20	Utah	43.50	5,818,205	6,421,633	2,254,156	574,772	15,068,766	346,408
20	Oklahoma	58.90	12,444,000	13,511,000	4,068,413	1,055,000	31,072,413	527,545
24	Ohio	1.20	264,700	251,000	61,200	15,000	591,900	493,250
24	W. Virginia	2.50	517,000	860,000	188,900	19,000	1,584,900	633,960
24	New Jersey*	4.79	1,171,047	3,884,809	1,494,078	252,920	6,802,854	1,420,220
24	Texas	8.50	2,682,000	1,674,300	1,237,700	25,000	5,619,000	661,059
24	Arkansas*	10.00	2,285,000	2,125,000	1,039,976	184,000	5,633,976	563,398
24	Massachusetts*	13.60	4,037,000	6,561,000	3,476,518	1,309,000	15,374,518	1,130,479
24	Miss., La.	47.14	14,261,000	22,304,000	5,870,144	1,807,000	44,242,144	938,527
24	Texas	49.00	29,550,000	34,250,000	19,730,418	3,300,000	86,830,418	1,772,049
24	Texas	185.00	38,389,000	24,133,000	8,217,000	2,461,000	73,200,000	395,676
26	Iowa-Ill.*	59.30	17,975,500	18,279,800	8,538,692	1,905,600	46,699,592	787,514
30	Colorado	3.70	1,152,000	8,252,000	2,333,681	64,342	11,802,023	3,189,736
30	Pennsylvania*	12.39	3,191,523	4,791,344	2,307,207	277,550	10,567,624	852,916
30	New Jersey*	14.10	7,076,800	7,175,200	4,452,946	1,230,000	19,934,946	1,413,826
30	New Jersey	15.51	6,901,418	5,855,613	4,733,165	347,510	17,837,606	1,181,298
30	Arkansas*	16.32	4,623,000	3,971,000	2,008,912	276,000	10,878,192	666,559
30	Arkansas*	23.76	6,417,000	5,555,000	2,796,510	380,000	15,148,510	637,546
30	Massachusetts*	30.00	11,791,200	15,052,300	8,090,689	1,190,000	36,124,289	1,204,143
30	Arkansas*	34.36	10,462,000	8,945,000	4,893,000	630,000	24,930,567	725,569

Indeed, during the third quarter of 1983, costs declined, as measured by the OGJ-Morgan indexes.

Table 3 lists a 10 year onshore construction cost trend for natural gas pipelines with diameters ranging from 8 to 36 in. As the table reflects, the average cost per mile for any given diameter may increase or decrease from one year to the next, due to such variables as terrain, population density, and others affecting construction cost.

The cost/mile trends from 1983 to 1984 are mixed, with four diameter classifications showing increases while three show declines. Construction figures for an 8 in. OD pipeline, for example, leaped from $167,234 to $322,132/mile, an increase of 92.6%.

On the other hand, construction costs for a 16 in. pipeline plunged $1,576,758 for 1983 to $340,226/mile for 1984, a drop of 78.4%.

The 10-year trend nonetheless shows a consistent rise in average construction cost per mile.

Table 4 lists 46 pipeline construction projects onshore and 18 projects offshore. The onshore projects represent 2,471.52 miles of pipeline at an estimated price tag of more than $2,013 million, and the offshore pipeline projects represent 160.65 miles of offshore pipeline with an estimated price tag of more than $171 million. The pipeline projects represent the major construction permit (CP) applications for natural gas pipelines filed with FERC from June 1, 1983, to June 1, 1984.

The pipelines are listed in order of increasing diameter and in increasing lengths within each pipeline diameter. The average cost per mile for the projects shows no clear-cut trend related to either length or geographic area. In general, the cost per mile within a given diameter indicates that the longer the pipeline, the lower the cost per mile for construction. Nonetheless, road, highway, and river crossings and marshy or rocky terrain each strongly affects pipeline construction cost.

The accompanying charts, derived from Table 4 for both onshore and offshore pipelines, show the major components of pipeline construction cost. For onshore pipelines, material—including line pipe, fittings, valves, coating, etc.—represents an average of 35.2% of the construction cost; labor, 40.1%.

By contrast, for offshore pipelines, material represents 31.9% of the construction cost; labor, 49.5%. Thus, labor and material comprise 75.3% of the cost of constructing onshore pipelines and 81.4% for offshore pipelines.

Table 4

			$					
Size, in.	Location	Miles	Material	Labor	Misc.†	R.O.W. & damages	Total	$/mile
30	Pennsylvania*	71.00	29,570,900	30,418,600	19,937,868	1,544,000	79,531,368	1,120,160
30	Pennsylvania*	86.53	30,178,000	40,508,000	7,003,318	1,465,000	79,154,318	914,762
30	New York*	87.00	30,897,700	35,096,100	19,967,549	2,088,000	88,049,349	1,012,061
30	Ark.-La.	112.00	29,668,000	27,072,000	15,312,888	1,792,000	73,844,888	659,329
36	N. Mexico§	1.46	823,000	362,000	367,071	—	1,552,071	1,063,062
36	New Jersey*	4.17	1,698,594	5,086,135	1,887,417	267,000	8,939,146	2,143,680
36	Pennsylvania*	4.95	2,807,399	2,489,144	1,482,111	110,880	6,889,534	1,391,825
36	New Jersey*	12.37	5,105,846	5,764,702	3,115,509	494,875	14,480,932	1,170,649
36	Iowa§	29.49	10,687,000	6,357,000	2,182,000	399,000	19,625,000	665,480
36	Pennsylvania*	29.55	10,197,807	13,276,672	6,660,045	661,920	30,796,444	1,042,181
36	Texas§	31.50	14,587,000	7,313,500	7,069,300	403,200	29,373,000	932,476
36	Arkansas*	48.22	20,563,000	14,568,000	9,047,672	1,852,000	46,030,672	954,597
36	Iowa-Ill.§	81.00	31,000,000	17,331,000	5,267,000	2,521,000	56,119,000	692,827
36	Ind.-Ohio*	121.40	38,999,909	44,361,091	15,303,000	3,261,000	110,925,000	839,580
36	Pennsylvania	155.30	63,172,613	66,798,387	24,211,000	2,897,000	157,079,000	1,011,455
36	Iowa-Ill.	28.95	90,656,000	106,760,000	46,999,000	16,304,000	260,719,000	900,584
42	Louisiana*	22.46	9,970,487	6,513,119	4,052,799	898,375	21,434,780	954,354
42	Louisiana*	28.13	12,299,925	8,411,779	5,166,136	1,485,330	27,345,170	972,100
42	Iowa§	38.47	18,386,000	10,937,000	3,753,000	686,000	33,762,000	877,619
42	Ill.-Ind.	62.30	31,964,997	32,471,003	12,035,000	2,588,000	79,059,000	1,269,005
42	Ohio-Pa.	217.60	138,549,026	101,147,974	44,477,000	7,001,000	291,175,000	1,338,120
OFFSHORE PIPELINES								
10	Texas	0.96	456,500	2,082,800	657,500	1,200	3,198,000	3,331,250
10	Louisiana	2.40	810,000	1,760,000	499,000	1,000	3,000,000	1,250,000
10	Texas	2.20	440,000	1,550,000	677,089	—	2,667,089	1,212,313
10	Texas	7.19	1,600,000	2,200,000	700,000	—	4,500,000	625,869
12	Texas	2.02	785,500	2,413,000	819,700	1,200	4,020,100	1,990,149
12	Louisiana	4.90	1,345,000	2,850,000	504,000	1,000	4,700,000	959,184
14	Louisiana	11.50	3,002,000	4,145,000	752,000	1,000	7,900,000	686,957
16	Texas	12.60	2,489,375	2,997,630	1,645,272	—	7,132,277	566,054
20	Texas	0.85	347,600	680,500	277,500	1,200	1,306,800	1,537,412
20	Texas	3.68	1,701,600	3,092,600	1,378,200	1,200	6,173,600	1,677,609
20	Texas	6.14	2,272,000	3,699,900	1,649,500	1,300	7,622,700	1,241,482
20	Texas	8.50	3,200,000	4,700,000	2,332,911	—	10,232,911	1,203,872
20	Louisiana	20.10	5,957,000	7,106,000	1,415,000	99,000	17,788,000	735,721
20	Texas	32.64	9,863,700	10,943,000	6,475,850	1,500	27,285,000	835,938
24	Texas	18.00	12,250,000	11,500,000	7,250,000	—	31,000,000	1,722,222
24	Louisiana	26.97	11,998,000	13,355,900	7,277,745	1,355	32,633,000	1,209,974

Source: FERC construction permit applications, 6/1/83-6/1/84. *Loop.
§Replacement. †Includes engr., supv., surveying interest, adm. & overhead, contingencies, and FERC fees.

Slight improvement noted by tanker owners

A SMALL INCREASE IN WORLDWIDE demand for crude oil during 1984 combined with a fall in the number of tankers available to move this crude produced a marginal improvement in the fortunes of tanker owners.

After a decade of crisis, owners have realized that a small improvement in one year does not spell an end to the bad times and they are now looking for a continuation in the growth of demand during 1985 and a further reduction in the size of the tanker fleet.

The independent tankers owners group, Intertanko, has already warned its members against complacency as the short term outlook for the industry is not bright.

According to Intertanko, 1984 did not see the end of the hard times for the tanker business but it may have possibly seen the beginning of the end of the crisis.

Ever since the mid 1970s the tanker business has been stricken with a debilitating malaise -- too many tankers chasing a declining volume of crude moved by sea.

Last year however, demand for crude oil outside the eastern bloc grew by 2.4% compared with a decline of around 2% in 1983.

All the indications are that during 1985 growth will be much slower and may not exceed 1% despite the decision by the Organization of Petroleum Exporting Countries to lower prices for 1985.

Tanker owners have been staunch supporters of lower oil prices in the hope that this would make oil more competitive with other forms of energy and increase overall demand.

While demand was expanding during 1984, the size of the tanker fleet was declining. There was a net reduction in the volume of tankers and combined carriers amounting to 19.5 million dwt, bringing the size of the fleet down to 1975 levels.

However, oil demand, at around 46 million b/d is around 1 million b/d less than its 1975 level. At the same time there has been a structural change in the way this oil is supplied.

The countries of the Middle East and Africa are no longer the dominant producers. Non-OPEC countries such as Britain and Norway have edged their way into the market at the expense of OPEC with the result that the demand for OPEC crude has declined from a peak of 30 million b/d to under 15 million b/d at the beginning of 1985.

For tanker owners this has been bad news. The new sources of oil such as the North Sea and Alaska have been closer to the consumers. Large volumes have been moved by pipeline reducing the overall need for tankers.

Tankers demand for OPEC production

	16 million b/d	17.5 million b/d (in million dwt)	19 million b/d
Middle East	72.6	67.8	61.4
North Africa	7.0	6.4	5.8
West Africa	8.8	7.5	7.4
Caribbean	13.7	12.6	12.3
Far East	7.5	7.0	6.4
North Sea	3.7	3.7	3.7
Coastal & intra-regional	42.2	42.2	42.2
Total	**155.5**	**147.2**	**139.0**

In the longer term new pipelines may also reduce some tanker demand for moving Middle Eastern crude.

Iraq's Arabian Gulf terminals were knocked out in the very early stages of the war with Iran. Apart from relatively small quantities trucked out through Jordan, the bulk of Iraq's exports are through a pipeline to the Mediterranean via Turkey.

The capacity of this line has been increased to over 1 million b/d and Iraq is now in the detailed planning stage of a new pipeline to the Red Sea making use of some spare capacity in Saudi Arabia's Petroline system to Yanbu on the Red Sea.

Iran is also looking at plans for a pipeline through Turkey to the Mediterranean and a separate line from the oilfields in south west Iran, close to the border with Iraq, across country to a proposed new terminal on the Indian Ocean.

It is not clear whether all these lines will be built but if the war continues there will be pressure for transportation systems that are outside the range of opposing enemy jets.

In the early part of 1984, OPEC production began to move forward and owners were able to bring a number of vessels out of lay-up. Although the trend was not sustained it was enough to put a slight brake on the demolition program.

The upsurge in output in the early part of 1984 with only a small increase in real demand for crude in the industrialised countries ultimately pushed OPEC into an end-year crisis in which it was forced to slash its production ceiling from 17.5 million b/d to 16 million b/d and later introduce tough measures to encourage member states to abide by their national production quotas.

The brunt of the reduction in OPEC production was carried by Saudi Arabia which hit the tanker trades particularly hard. For tanker owners big reductions in oil liftings in the OPEC countries have a disproptionate effect on demand for tankers. Small rises in output from non-OPEC nations do not yield fully compensatory rises in the requirement for tankers.

London-based Drewry Shipping Consultants estimates that an OPEC ceiling of 17.5 million b/d, requires total world tanker tonnage of 147.2 million dwt. At the new OPEC ceiling of 16 million b/d demand for tankers is down to 139.2 million dwt.

An increase in OPEC production to 19 million b/d expected when oil companies begin to rebuild stocks, would push demand for tankers to 155.5 million dwt.

Calculations by Drewry show how important the Middle East is to the health of the tanker business.

With OPEC production at 16 million b/d and tanker employment at 139 million dwt, only 61.4 million dwt of tankers are needed in the Middle East but this rises to 72.6 million dwt with a 3 million b/d rise in output. There are relatively small increases in demand in other areas as OPEC output rises.

Intertanko has taken the view that market equilibrium can only be restored by a continuing program of reductions in the tanker fleet.

Last year 49 very large crude carriers (VLCCs) and ultra large crude carriers (ULCCs) were scrapped, fewer than in 1983. Any short term recovery in the spot market rates for tankers seems to put a damper on sales for demolition.

This is not unnatural as owners grasp at the chance of some business for idle loss-making vessels. Intertanko says this is not only detrimental to the VLCC market. It hits all the other inter-related tanker sectors

Owners are also concerned that continuing increases in demand for oil will put a further brake on demolition sales and that terms offered by shipbuilding nations to encourage more tanker building will bring new capacity onto the market for which there is no logical use.

Some replacement of the VLCC fleet is necessary. At the end of last year, orders for new tankers represented about 3% of the existing fleet, a figure that is unlikely to cause any serious problems in the market place.

But there has been a trend towards shipbuilding nations offering subsidies to to shipbuilding yards that are designed to to promote speculative orders from shipowners and providee work for construction facilities that might otherwise be forced to shut down or lay off more workers.

Combined with these subsidies are soft credit terms from banks. Owners are able to get advantageous credit without the requirements of back-up charters.

Intertanko said it has tried to show governments and banks the dangers of continuing these incentives to building more ships.

'We can only hope that banks will refrain from providing soft credit for speculative orders and that Governments finally will see that subsidies cannot be used to solve the shipping and shipbuilding crisis.' said a spokesman for the organisation.

Intertanko said governments in Western Europe and Brazil were under pressure to increase subsidies further. The Italian Government was planning to make about $300 million available for a new subsidy scheme for Italian owners. Foreign owners would have to set up an Italian company to qualify for the benefits of this program.

West Germany was also planning to maintain subsidy levels and although the Organisation for Economic Cooperation and Development also warned of the dangers inherent in further subsidies for tankers, the Association of Western European Shipbuilders has said it hopes that in the coming years money will continue to be made available from taxpayers to maintain these subsidies.

In Japan local shipbuilders have asked the government for $555 million in subsidies for the 1985 financial year beginning in April.

New vessels were ordered throughout last year with most of the orders going to Far East yards.

Intertanko has also criticised the role of brokers in placing new orders. They play an important part, both before and under the contractual negotiations with the shipyards.

Tonnage sold for scrapping 1984 (No. ships, '000 dwt)

Dwt	Tankers	Comb. carr.
0- 17	7- 98	0- 0
18- 39	69- 1813	2- 64
40- 59	21- 1001	0- 0
60- 79	31- 2140	3- 202
80- 99	17- 1515	3- 260
199-199	6- 768	3- 411
200-	48-12235	1- 226
Total	**199-19570**	**12-1163**

Source: FEARNLEYS

Several of the large brokerhouses have advanced market research departments and the balance between a sober future market evaluation and the temptation to push for a new contract and earn a commission, says Intertanko, is not always an easy one.

Throughout 1984 and the early part of 1985 much of the tanker market's attention was centered on the situation in the Arabian Gulf.

Attacks on tankers continued throughout this period although the loss of life and damage from the attacks was less than had been predicted.

Initially, the attacks were started by the Iraqis against vessels using Iran's Kharg Island terminal. As these attacks pushed up insurance and freight rates, Iran responded with attacks on shipping using Kuwaiti and several other ports at the northern end of the Gulf. Missile attacks were not restricted to tankers and several offshore supply vessels and diving support ships were hit.

After a lull in the Fall of 1984, Iraq resumed attacks on vessels trying to reach the Kharg Island terminal. At one stage the attack strategy was so successful that the Japanese, the main purchasers of Iranian oil, suspended tanker trade with Kharg.

Kharg is only one of Iran's export outlets. Throughout the war exports from the Lavan and Sirri offshore field terminals at the southern end of the Gulf have continued without interruption, outside tthe range of Iraqi strike aircraft.

But these terminals have access to limited output and have rarely been able to make more than 250,000 b/d available to foreign-owned or chartered tankers.

In an effort to frustrate Iraqi air attacks the Iranians have begun moving crude from Kharg Island in its own tankers and trans-shipping oil into export vessels outside the range of the Iraqi jets.

To ensure that the shuttle syustem worked efficiently the Iranians went to the market and chartered two ULCCs of over 340,000 dwt which were moored off Sirri island and used as floating storage and transhipment units.

Five other tankers between 340,000 and 400,000 dwt, again chartered by the Iranians , were used to move up to 1 million b/d from Kharg to the Sirri Island transhipment points.

The transhipment terminal is only 280 miles from Kharg but this is enough to eliminate the threat from hostile Iraqi jets during the sensitive loading period.

The shuttle tankers are mainly Liberian and Norwegian flagged vessels and several have been under attack as they approached Kharg. The island itself is heavily defended and the Iraqis have restricted their attacks to vessels approaching the terminal but outside the range of the island defences.

Tanker sources say they have been surprised at the lack of damage caused to vessels attacked by Iraqi jet using Exocet missiles, which caused such damage to British naval vessels during the Falklands war.

Highly volatile gas tankers have been atttacked by the Iranians but again have escaped without catastrophic damage.

According to some tanker captains the secret of surviving a missile attack is taking the correct precautions during the approach to Kharg.

Heat seeking missiles generally hit the vessels' engine room. The captain of the Norwegian-owned, 233,000 dwt Thorshavet said he ahd kept the engine room as cool as possible after leaving Kharg with a cargo of crude.

The crew were also kept as far away from the engine room as possible during the critical exit from the the war zone around the island. The vessel was hit by an Exocet but sustained relatively minor damage above the waterline.

None of the crew of 26 were injured. The cargo was untouched and discharged into other vessels in a safe area.

Not all the tankers attacked in the Gulf escaped so lightly and several were sold directly to the breakers yards. During 1984 the demoltion business has become extremely competitive as new nations have tried to enter the business in a bid to keep their own yards active.

Shipbreaking tends to be a labor intensive business and the bulk of this business has gone to ccountries with low labor costs. The yards in Taiwan still head the league both for tankers and other forms of shipping.

During 1984, mainland China made a major bid to become a force to be reckoned with in ship demoltion and stepped up its purchases of redundant tankers three fold. Industry sources now accept that China is number three in the ship demolition field after Taiwan and South Korea.

The high labor costs involved in shipbreaking have so far, generally kept high wage cost countries out of the business. However, a French yard in Brest began scrapping small vessels recently and said it plans to move onto bigger vessels.

A company in Japan has developed a new cutting system which may revolutionise the shipbreaking industry and open new opportunities for high labor cost countries.

Nippon Sempaku Kaihatsu Kogyo Corp of Tokyo has developed a dismembering machine that can cut through steel plate at high speed with minimum manual supervision.

The torch cutter is attached the the hull magnetically and the Japanese company claims that using this equipment can reduce the break-up time for a VLCC to 120 hours.

A total fo 48 tankers over 200,000 dwt and one combined carrier in this category were scrapped during 1984 which removed a total of 12.46 million dwt from the world fleet.

The slight improvement in business which has led to some vessels being taken out of lay-up, combined with high levels of scrapping, has reduced the amount of idle tonnage throughout the world.

According to Lloyds of London there were 358 vessels laid-up at the end of 1984 with a total weight of 54.32 million tonnes. That compared with 422 vessels of 63.15 million tonnes at the end of 1983.

The bulk of the lay-ups are vessels over 200,000 dwt. Although a few big tankers have been reactivated, most of the movements from lay-up have been small vessels. At the end of last year around 15 vessels under 50,000 dwt were brought back into service and two vessels just over 100,000 dwt found employment after several years idleness.

Lay-ups are not the only symptom of the problems facing the industry. A survey of vessels over 200,000 dwt by E.A. Gibson and Intertanko shows that out of a total fleet of 526 vessels of 147.1 dwt, 314 vessels with a weight of 89.7 million dwt were surplus to requirements – about 60% of the total fleet.

Tankers continue to find work as temporary or permanent floating storage. At the beginning of February this year over 20 million dwt of tankage was used as storage. According io figures from London shipbrokers Howard Houlder (Chartering) there were 96 vessels involved in storage of which 37 were owned by oil companies. The rest were independently owned.

The biggest concentration of storage vessels is in south east Asia where there are 36 tankers with a total weight of 7.5 dwt. West Africa comes second in this league with 16 vessels of just over 4 million dwt.

The Arabian Gulf and the Arabian Sea which at one time had large numbers of storage tanbkers, still has 13 vessels with a total weight of 3.03 million dwt. In Japan there are 9 vessels of 2.3 million dwt; in the US and the Caribbean there are 6 storage vessels of just under 2 million dwt and in the Mediterranean there are 3 tankers with a total weight of 611,962 dwt.

Brazil has eight storage tankers, mostly involved in their early production systems, which have a total weight of 263,689 dwt and the remaining five vessels of 316,250 dwt are on station in other parts of the world.

Howard Houlder Chartering says China has recently become interested in offshore storage.

Officials from the state oil companies have been studying the various tanker storage options and have recently purchased a 170,000 dwt vessel.

The brokers say Consafe of Sweden and Mitsui of Japan are engaged in a joint venture to use the 137,160 dwt Anastasis II as an offshore storage vessel in the South China Sea.

Interest is also coming from other parts of the world. Occidental Petroleum has been sounding out the market for a ULCC which would become part of its proposed Colombian development and export project.

Tankers have also gained popularity as the basis for offshore production systems. Purpose-built systems are currently under construction in the Far East for a Norwegian group and in Northern Ireland for British Petroleum.

BP's system known as SWOPS will be used initially to develop a small oil accumulation in UK North Sea block 16/28 while the Norwegian system may be employed for early production on Norsk Hydro's Oseberg field.

The dynamically positioned hull for SWOPS is under construction at the Harland and Wolff shipyard in Belfast and the system, expected to cost $124 million should be operational on the Cyrus field in 1987.

The seabed wellhead facilities for Cyrus will be completed while SWOPS is under construction. The vessel will be fitted with a derrick and hoist for running and retrieving a rigid riser. It will also have a process plant and a flare stack for the disposal of surplus gas.

The vessel will load via a rigid riser attached by remote control to a subsea wellhead unit from which two deviated wells will have been drilled.

Cyrus will be able to produce about 15,000 b/d which will go through the two stage sepration on the vessel. Crude will be loaded into the cargo tanks and separated water and oil will be diverted into special slop tanks for treatment. Some gas produced during loading will be used to power the vessel while on station.

SWOPS will have a draught of 10.75 meters and a segregated ballast capacity of some 38,000 tonnes. The dynamic positioning system should be capable of keeping the vessel on station in storms of up to Force 9.

When the cargo tanks are full the vessel will disconnect and deliver the crude to an onshore terminal. It will then return to Cyrus or other tiny marginal fields that BP has earmarked for SWOPS-style production.

Idle tankers could be usefully employed as floating reception plants for tanker wastes until permanent facilities required by new anti-pollution measures are implemented.

Intertanko says governments are continuing to baulk at the investment needed to provide adequate shore reception for tanker wastes. Tanker crews desparately need these facilities to comply with the MARPOL 1973/78 Convention.

Lack of shore reception terminals is now causing serious problems for tanker owners and Intertanko has suggested

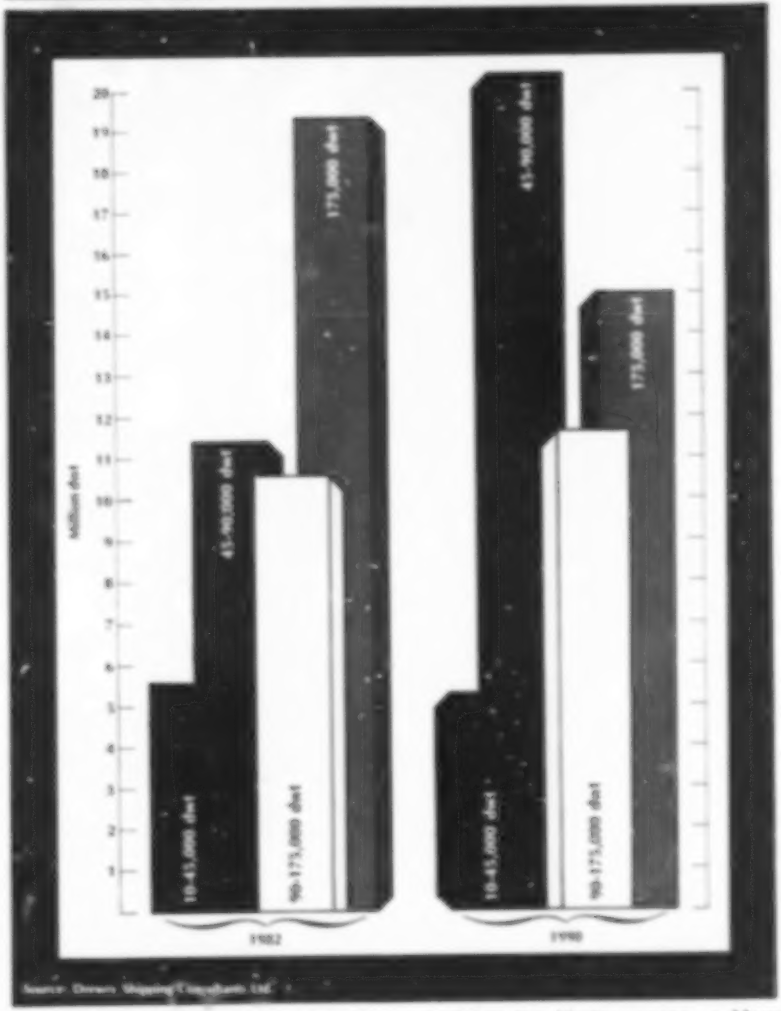
Scrapping sales by countries (No. ships, '000 dwt)

Tankers & combined carriers

Month	Taiwan	Korea	In Pa BD	China	Spain	Others	Total
JAN	10- 1427	2- 485	2- 38	0- 0	0- 0	2- 243	16- 2193
FEB	8- 809	5- 697	2- 54	2- 41	1- 27	2- 92	20- 1720
MAR	4- 316	3- 439	2- 42	0- 0	1- 37	1- 35	11- 869
APR	9- 545	3- 388	0- 0	0- 0	1- 27	0- 0	13- 1060
MAY	16- 1244	6-1121	0- 0	0- 0	1- 19	3- 291	26- 2675
JUN	6- 315	2- 157	1- 21	0- 0	0- 0	1- 135	10- 628
JUL	4- 392	3- 551	3-121	1- 12	3- 83	3- 56	17- 1215
AUG	9- 852	2- 251	6-187	0- 0	3- 65	3- 323	23- 1678
SEP	13- 1813	3- 542	0- 0	3- 446	2-119	5- 200	26- 3120
OCT	5- 758	2- 173	1- 36	1- 259	4- 95	1- 44	14- 1365
NOV	9- 917	1- 83	0- 0	4- 565	0- 0	4- 155	18- 1720
DEC	9- 1758	2- 338	2- 48	20- 301	1- 21	1- 25	17- 2491
TOTAL	**102 - 11246**	**34 - 5225**	**19 - 547**	**13 - 1624**	**17 - 493**	**26 - 1599**	**211 - 20734**
Dry cargo vessels							
TOTAL	**122 - 2487**	**22 - 445**	**164 - 1939**	**127 - 2383**	**26 - 325**	**42 - 602**	**503 - 8181**
Total scrapping sales							
TOTAL	**224 - 13733**	**56 - 5670**	**183 - 2486**	**140 - 4007**	**43 - 818**	**68 - 2201**	**714 - 28915**

Source: FEARNLEYS

U.S. tanker demand by size category, 1982-90



Source: Drewry Shipping Consultants Ltd.

that tankers should be moored in strategic locations to act as floating waste reception plants.

The organization also warned that failure to take interim action of this sort could lead to serious legal disputes amoung members of the International Maritime Organisation (IMO) due to the inability to comply with the MARPOL restrictions of discharges and disposal of wastes.

Mr J.P. Page, chairman of Intertanko's Safety and Technical Committee told a London conference: 'Many nations have failed to meet their obligations under Marpol to provide adequate shore reception. The problems are especially acute in the Mediterranean.

'The lack of shore of shore reception is a threat to MARPOL and undermines confidence in the work of IMO,' he added.

The most stringent anti-pollution rules apply in the Mediterranean, a Marpol 'Special Area' but only a few of the 30 Mediterranean oil terminals have adquate shore facilities for wastes.

'Tankers operating in the Mediterranean cannot use load-on-top procedures. The very terminals that ban discharge of anything buy clean ballast have also failed to provide reception facilities.

Mr Page said propblems in the Meditrranean and elsewhere could be eased by making use of tankers as floating reception plants. This would bridge the gap until the IMO, United Nations and the European Economic Community succeeded in persuading governments to provide permanent facilities.

'This will take time - interim action is needed now if MARPOL is to be really effective in reducing pollution.

'If nothing is done, it is likely that disruptive legal disputes will arise between flag states and those port states which have failed to provide adequate shore reception.

'In addition a number of southern Mediterranean counties have still to ratify the MARPOL convention. They must do so as soon as possible. Mediterranean states must also tighten up their port state control measures to enforce MARPOL.

Intertanko's proposals for floating reception provide three options. The first would allow minor modification so tankers could act as mobile dirty ballast slop collection stations. While such vessels were readily available, this option had a disadvantage as the ships would have to make use of the nearest permanent reception facilities.

Tankers could be converted so they could treat received wastes and dirty ballast without the need to visit shore facilities.

There was also the possibility of a tailor-made solution to the problem. Intertanko said one private enterprise scheme under study envisaged a 90,000 dwt tanker stationed offshore, fully equipped to process oil wastes.

A smaller tanker would act as a tender, collecting wastes and dirty ballast from crude carriers passing through the area. Such a tanker could be on station within three months of ordering.

Whatever option was employed, Intertanko said the use of mobile reception facilities should be free so as to encourage use. A large proportion of running costs could be met by sale of recovered oil.

In the hard times afflicting tanker owners there has been a noticeable increase the the theft of tanker cargoes for use as bunker fuel.

The International Maritime Bureau says there is a link between the increase of crude oil thefts and the cut-backs in the number of vessels in oil-company owned fleets.

The IMB report said most oil companies had substantially reduced their own fleets during the past few years and now charter-in vessels as necessary.

All the problems over cargo theft that have came to light involved chartered-in vessels. The temptation for unscrupulous owners to pilfer bunker fuel from cargoes was bound to be greater when the tanker market was weak, said the report.

'The pressures on senior members of ships's crews to fall in with their owners in such practices are obvious.

'It is felt that if ships's officers were to be made fully aware of the dangers they face in carrying out cargo to bunker transfers they would be less likely to accede to owners' demands.

'There is no doubt that a practice which so blatantly contravenes any acceptable standard of safe operation cannot be allowed to continue unchecked,' it added.

The report said that the vast majority of frauds involved relatively small amounts of cargo crude. Proposed improvements in the handling of oil transportation documentation would help to maintain this relatively low incidence of fraud.

Tanker owners have also been criticised by Third World countries for denying access to the business to developing nations.

A United Nations committee was told that while the developing nations including members of OPEC, supplied 85% of crude oil traded outside the eastern bloc, these countries only owned 12.5% of the vessels.

Owners point out that the developing countries' tanker fleets grew by 122% during the past eight years. During this time the fleets of the open registry (flags of convenience) nations and the industrialised countries shrank by 10% and 13% respectively.

Developing countries are still not satisfied there is free access to the market despite assurances that anyone with capital and enterprise can acquire a ship and ply for trade. Owners are suspicious that developing countries want a guaranteed share of the market and want the industrialised and flags of convenience states to carry the full burden of reducing the overall size of the world tanker fleet.

Much of the attack by the developing nations has fallen on flags of convenience. At a French symposium in 1984, Mr Rainer Vogel, office in charge of UNCTAD's shipping division said operations by open registry nations had adversely influenced developing countries's aspirations to develop their own merchant fleets.

He said that while developed countries tend to regard the system of open registries as a positive element aimed at reducing the cost of sea transport and as offering a possibility of direct foreign investments to those commonly made by land-based industries, developing nations consider open registries as one of the major impediments to the expansion of their fleets.

Flag of convenience fleets had been expanding rapidly, particularly in the dry bulk and tanker sectors, and had now reached a share of nearly 30% of the total world fleet.

Vogel said the expansion of open registry operations had been a general cause of concern as it effectively meant that nearly one third of the total world merchant fleets were operated outside the scope of effective government control.

Flags of convenience had also greatly contributed to the irrational development of world bulk and tanker fleets over the past 10-15 years. The desire of shipowners to remain outside fiscal control in the countries of beneficial ownership had led to a situation where trading profits had been constantly recycled into shipping and inflated tonnage supply beyond the need of the trade.

'The results of these behavioural patterns are well known and are to a great extent reflected in today's desparate situation in both the bulk shipping and shipbuilding markets,' he added.

Open registries provided shipowners from developed countries with the possibility of relocating their activities without losing any control over them and creating an artificial competitiveness by avoiding rules and regulations established in the countries of beneficial ownership, including the possibility of uncontrolled employment of low-cost shipboard labor from the developing countries.

Intertanko whose members have 170 million dwt of tonnage and more than half of the world fleet of tankers and combined carriers, has played a leading role in the defence of open registries. Intertanko says that about 30% of its membership fleet flies flags of convenience.

In a discussion document Intertanko said opponents of open registers were making serious efforts to eliminate this type of shipping through a binding international convention which would contain such strict conditions regarding registration that open registry shipping would be eliminated.

'The campaign against open registry shipping started with reference mainly to safety and environmental issues which are issues of the highest priority for Intertanko.

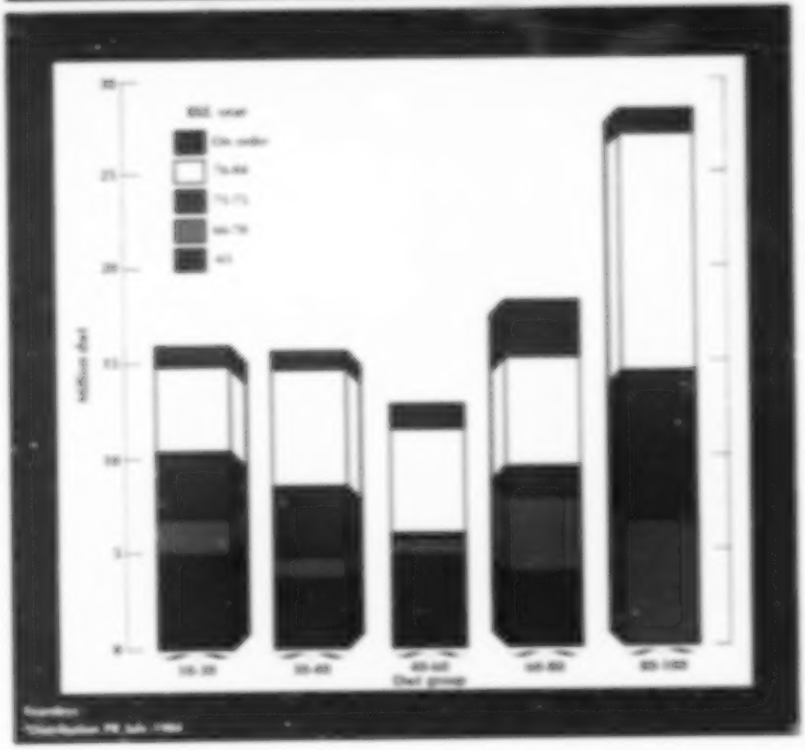
'But safety and protection of the environment should not be confused with the flag of convenience or open registry issue. Poor safety and pollution are not confined to open registry shipping. Indeed, some of the world's safest and best run ships sail under flags of convenience,' it added.

Intertanko said international standards for improved safety and protection of the marine environment had during the 1970s, been developed in a United Nations body, the International Maritime Organization.

New IMO conventions and recommendations had increasingly emphasised the need for port state control and are now being implemented to secure compliance with internationally agreed standards.

As a result, Intertanko says the attack on open registry shipping had changed in nature. The new approach was a claim that the existence of open registry shipping represented a hinderance to the expansion of developing countries' shipping.

Tankers 10-100,000 dwt size/age*



'The opponents of open registry shipping trust that elimination or substantial reduction of the open registry fleets will have an expanding effect on the developing countries' shipping. We do not find this reason very convincing' said the independent tanker owners.

The organisation points out that since the Second World War the shipbuilding industry once dominated by the United States and Europe had been overtaken by low labor cost countries, first Japan and then South Korea, with mainland China now emerging as a force in the market.

Subsidies offered in Europe had distorted the trend and suppressed normal competition but had not stopped the overall shift in the centers of shipbuilding.

'Now some of the same type of shift has also been seen, and is still seen in the shipping industry. Perhaps the basic reason why movement here has been different is the essential distinction between the shipbuilding industry being land-based, labor intensive and dependent on local labor; whereas ships are moveable and the location of their operating offices and the home bases of the crew are, seen in relation to the shipbuilding industry, considerably less important to the efficient operation of the ship.

' A shift had been seen away from the United States being the most important shipping nation imediately after the Second World War, and now priced out of international shipping, via Western Europe, which has stagnated, and to the rapid expansion of new fleets including Arab and Turkish fleets.

The graph based on Unctad figures shows that the developing countries are well on their way to acheiving the goal of 20% of world shipping by 1990.

Intertanko says the way to acheive this goal is not by eliminating one type of shipping, but to make it easier for entrepreneurs wishing to enter or expand in this type of activity.

The organisation says there is no evidence to support the hypothesis that adoption of an international agreement which might be incompatible with many countries current registration rules, would lead to an increase in the developing countries' participation in shipping.

'Nor is there any evidence indicating that open registry operations do in fact limit the growth of shipping operations in the developing world.

Intertanko points out that the tanker market is one of the few genuinely competitive markets in the world as it satisifed all the usual conditions required of a competitive market. These are:

* The transport service is homogeneous, so that the shipper has no cause to prefer one shipowners to another, provided safety standards are met.

* There is free entry - nothing prevents a new company from entering the industry, with one or several ships, provided the company has confidence in its ability to engage in the activity and has access to finance.

*There is unrestricted exit. Second--hand and demolition markets enable companies to divest themselves of their tankers at short notice.

*Ship technology is widely publicized and embodied in the vessels. Existing or new companies therefore have access to the same technology.

*No single company or group of companies can exert a measureable influence on freight rates or ship values - one of the most important criteria for a genuinely competitive market.

*There is a near-perfect flow of market information available to all interested parties. Flag or nationality is no barrier to access to this information.

*As one vessel is small relative to the total demand, there are nearly perfectly divisible units of supply.

The opening up of new export refineries in the Middle East has also given some parts of the tanker industry the hope that a new market for product tanker will develop.

But Intertanko is not optimistic about these prospects. It says if the owners of the Middle East refineries decide to sell on a CIF-basis or become fully integrated like the Kuwait Petroleum Co, utilisation of larger product tankers seems likely.

But if the trade is fragmented with a significant element of independent traders and with refiners selling on an FOB--basis, the chances of using larger product carriers will be lessened.

Projections for export availability from OPEC countries show 1.6-1.8 million b/d in 1985 which could grow to a peak of 2.0.-2.4 million b/d in 1987 and level off or fall slightly during the rest of the decade.

Intertanko says that as there is an inter-relationship between all liquid bulk trades, both regarding size and type of vessels, the potential of the existing fleet, with the present surplus capacity, for the carriage of oil products is extremely large and should be considered in connection with the importance of cost-minimization for cargo owners.

A crude carrier, fitted with heating coils is perfectly capable of carrying dirty products. A designated chemical carrier can easily operate in the clean products trade. Most LPG carriers can carry clean products and many of these already have certificates for such trade and most combined carriers are capable of carrying clean products.

In view of the limited long term growth in the products trade, Intertanko says there seems little justification for further orders of product tankers larger than about 80,000 dwt.

The market for handy and medium sized product carriers is more difficult to assess because of the age structure of the existing fleet and the impact of IMO regulations.

The structure of the existing fleet in the10,000 to 100,00 dwt range is marked by a signficant number of older vessels. About 20-45% of the fleet, depending on the size group is more than 15 years old.

The future of the tanker fleet is however, dependent on scrapping of older tonnage and deliveries of new buildings.

During the first three quarters of 1984, 59 new tankers and combination carriers were delivered with a total weight of 2.9 million dwt.

Of these, 23 vessels were dedicated product carriers with most in the smaller size group.

Existing fleet (10-100,000 dwt), Size/age distribution, Jan. 1, 1984, tankers and combination carriers

Size groups in '000 dwt	Year of Build					
	– 1963	1964-68	1969-73	1974-78	1979-83	Total
			Number of Ships			
10-30	286	114	193	209	205	1.007
30-40	111	18	61	198	119	507
40-60	61	55	3	32	97	248
60-80	8	97	25	31	95	256
80-100	1	51	35	112	44	243
Total	**467**	**335**	**317**	**582**	**560**	**2.261**
			Tonnage-'000 Dwt			
10-30	5.796	2.241	4.248	4.424	4.098	20.807
30-40	3.863	646	2.106	6.714	4.215	17.544
40-60	2.935	2.849	158	1.736	5.108	12.786
60-80	538	6.[illegible]8	1.819	2.300	6.817	18.232
80-100	85	4.517	3.189	9.900	3.886	21.577
Total	**13.217**	**17.011**	**11.520**	**25.074**	**24.124**	**90.946**

Source: H. Clarkson & Co. Ltd.

WORLDWIDE GAS PROCESSING

Capacities as of January 1, 1984, and average production

		MMcfd		Production—1,000 gal/day (Averaged based on the past 12 months)								
State	No. plants	Gas capacity	Gas through-put	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other	Total products
Alabama	5	182.0	97.4		125.7		105.2			44.5	324.2	599.6
Alaska	2	62.0	45.0		6.0				50.8			56.8
Arkansas	3	130.0	62.3		28.6	7.6	18.1			24.6	4.0	82.9
California	37	1,483.1	715.5		483.6	13.3	270.5	15.8	364.2	121.9	10.8	1,280.1
Colorado	44	858.0	475.4		98.9	0.9	53.4	2.0	785.1	53.2	15.2	1,008.7
Florida	3	961.5	766.0	73.7	133.4	23.5	65.7			77.7		374.0
Illinois	2	551.5	456.6	497.6	352.8	46.9	79.0		3.5	6.0		985.8
Kansas	25	4,901.5	2,704.9	98.0	579.3	64.2	209.0	2.2	824.6	165.1		1,942.4
Kentucky	2	897.6	654.0								431.2	431.2
Louisiana	106	22,194.5	11,587.0	1,554.1	1,326.9	401.6	485.6	15.9	4,755.1	722.0	591.1	9,852.3
Michigan	6	449.4	228.3		39.8				861.8	22.7	2.1	926.4
Mississippi	7	1,005.0	474.8		8.0		7.7	1.5	26.3	8.1		51.6
Montana	8	58.0	36.6		32.2		16.5	7.1	38.5		1.5	95.8
Nebraska	2	13.5	3.4		4.9		2.4	3.0		1.6		11.9
New Mexico	44	3,683.3	2,051.2	128.5	85.5	5.6	38.6	57.1	3,465.6	47.2	17.3	3,845.4
North Dakota	9	306.8	202.6		227.5	2.7	130.3	23.3	58.5	78.0		520.3
Oklahoma	104	4,857.6	2,866.3	506.4	734.6	119.9	246.1	236.2	3,226.2	253.5	247.4	5,570.3
Texas	415	23,504.6	12,519.2	2,544.9	3,235.4	447.5	1,499.9	1,051.5	12,225.7	1,895.2	1,882.3	24,782.4
Utah	10	520.5	256.9		115.0		26.0	32.6	130.7	68.0		372.3
West Virginia	6	410.0	268.0	224.1	149.8	25.9	49.1		239.9	9.2		698.0
Wyoming	40	1,912.6	1,105.4		338.2	4.5	211.8	134.7	589.5	242.2	162.2	1,683.1
Total	**880**	**68,943.0**	**37,576.8**	**5,627.3**	**9,106.1**	**1,164.1**	**3,514.9**	**1,582.9**	**27,646.0**	**3,840.7**	**3,689.3**	**55,171.3**

		MMcfd		Production—1,000 gal/day (Averaged based on the past 12 months)								
Country	No. plants	Gas capacity	Gas through-put	Ethane	Prop.	Isobut.	Normal or unsplit butane	LP-gas mix	Raw NGL mix	Debut. nat. gaso.	Other	Total products
Abu Dhabi	4	2,048.0	1,540.3		1,180.4	288.8	429.8			585.4	305.9	2,790.3
Algeria	4	5,335.2	4,268.2					632.8			5,449.2	6,082.0
Argentina	11	1,715.9	1,429.0	545.0	496.3		339.0			275.9		1,656.2
Australia	4	1,707.0	943.0	405.0	510.0		291.0				726.0	1,932.0
Austria	2	5.7	4.7						0.9			0.9
Bahrain	1	127.7	110.0		115.9		96.4			141.5		353.8
Bolivia	2	474.0	380.0						32.6			32.6
Brazil	5	295.3	219.3					176.8	217.4	54.4		448.6
Brunei	1	48.0	40.0		12.5				37.1			49.6
Canada												
Alberta	327	17,245.4	10,691.1	3,396.5	2,005.1	165.1	1,089.0	599.9	3,398.9	3,028.8	412.1	14,095.4
British Columbia	6	1,885.4	774.8		13.7		9.0			3.9		26.6
Northwest Territories	2	197.0	40.6									
Saskatchewan	11	137.5	73.9						72.1		15.0	87.1
Chile	2	445.0	400.0		202.0		126.6			107.5		436.1
China, Taiwan	4	271.0	134.6	41.5	39.4	0.6	26.2		3.5	21.3		132.5
Colombia	2	125.0	125.0	145.0	29.0		7.0			6.0		187.0
Dominican Republic	1										277.2	277.2
Ecuador	2							2.4	9.1			11.5
Egypt	4	553.0	480.0					149.0	1,184.0		464.1	1,797.1
France	1	1,024.0	915.0		163.0		170.0			428.0		761.0
Germany	5	542.9	451.0									
Greece	1	9.8	7.8						16.0			16.0
Hungary	12	732.7	414.0		138.4	8.5	128.0	35.6	57.1	166.8	297.0	831.4
Indonesia	5	587.8	456.4		522.0		290.0	30.0			163.2	1,005.2
Italy	14	5,560.0	3,195.0					65.0		426.9		491.9
Kuwait	1	1,680.0	360.0		834.0		548.0			305.0	85.0	1,772.0
Libya	7	1,851.0	1,227.0					37.8	5,577.0		551.0	6,165.8
Mexico	9	3,807.0	3,467.0	3,154.4	7,525.4							10,679.8
Netherlands	1	330.0	130.0						6.3			6.3
New Zealand	1	96.0	58.0		19.1		1.8			5.6		26.5
Pakistan	5	1,215.0	1,092.1					21.3		7.8	3.1	32.2
Peru	3	50.0	16.0				1.0	6.8		34.1	2.3	44.2
Qatar	2	580.0	239.0		336.8		206.8			152.9		696.5
Saudi Arabia	5	4,300.0							1,176.0			1,176.0
Sharjah	1	250.0	250.0						1,316.0			1,316.0
United Kingdom	5	2,435.0	1,133.0		332.0		291.0			1,748.5	52.8	2,424.3
Venezuela	14	2,696.0	2,283.0	59.8	195.7			632.9	1,774.5	125.7		2,788.6
Total	**487**	**60,363.3**	**37,348.8**	**7,747.2**	**14,670.7**	**463.0**	**4,050.6**	**2,390.3**	**14,878.5**	**7,626.0**	**8,803.9**	**60,630.2**

To arrive at more accurate totals, natural-gas throughput and liquids production are estimated at 80% capacity in those cases where only capacities are available. This explains apparent discrepancies in the addition of some columns. The letters NR mean no response. *Indicates cycling operations. The symbol < denotes less than 100 gal/day.

Products listed in the last column are identified by numbers: 1—isopentane, 2—upgraded motor fuel, 3—diesel, 4—kerosine, 5—ethane-propane mix, 6—solvent naphtha, 7—jet fuel, 8—normal pentane, 9—residuum, bottoms, 10—distillate, fuel oil, 11—condensate, 12—gas oil.

The process methods in the third column are identified by the following numbers: 1—absorption, 2—refrigerated absorption, 3—refrigeration, 4—compression, 5—adsorption, 6—cryogenic—Joule-Thomson, 7—cryogenic-expander.

Figures in parenthesis do not represent primary production, and are not added in state totals.

Since this compilation includes cycling plants reprocessing pipeline gas, totals shown here for gas throughput do not relate directly to government data on total gas processed, or sold. Similarly, liquids production figures are based on yearly average and do not necessarily reconcile with government data.